

# Cross-Border Coordination to Reduce IWT in the Guatemala-Mexico Green Corridor – IWT076

## Lessons Learned & Recommendations

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### Abstract

Partners engaged in the IWT076 project supported by the United Kingdom’s Illegal Wildlife Trade Challenge Fund in the “Green Corridor of Guatemala-Mexico” provide a summary of project results, and a comparison of lessons learned during a similar, trans-frontier project focused on the Guatemala – Belize Adjacency Zone. We focus discussion on specific elements that can increase the viability of interventions to reduce the Illegal Wildlife Trade (IWT) in trans-frontier areas. We provide concise recommendations for conservation practitioners and donors interested in halting trans-frontier IWT, particularly in cases where high-value natural resources are extracted illegally from one country to meet national or global demand facilitated by IWT “hubs” based in a neighboring country. Finally, Annexes 1 & 2 detail specific results and lessons learned regarding the impacts of sustainable livelihoods investments undertaken during IWT076.

### Background

The United Kingdom’s Illegal Wildlife Trade Challenge Fund IWT076 project was implemented over a 31-month period (April 2020 – November 2022) to reduce the lucrative illegal timber trade detected at the “Green Corridor” within adjacent protected areas in Guatemala and Mexico (**Figure 1**). The project spanned the most remote sections of the trinational Selva Maya, the largest intact block of forest in Mesoamerica. In 2018, park rangers patrolling the Paxban management unit of Guatemala’s Maya Biosphere Reserve (MBR) detected dozens of poached “*granadillo*” trees (*Platymiscium* spp., also known as “*hormigo*” in Guatemala and “*hormigón*” in Mexico). The species is a valuable, rare hardwood increasingly sought by timber poachers as a substitute for rosewood (*Dalbergia* spp.) in response to rosewood’s increased scarcity.

During 2019, project partners in Guatemala including the Foundation for Eco-development and Conservation (FUNDAECO) and the Center for Conservation Studies (CECON) determined that timber poaching focused nearly exclusively on *granadillo* had expanded from Mexico into Guatemala’s Mirador-Rio Azul National Park, almost reaching the Dos Lagunas Biotopo. Partners

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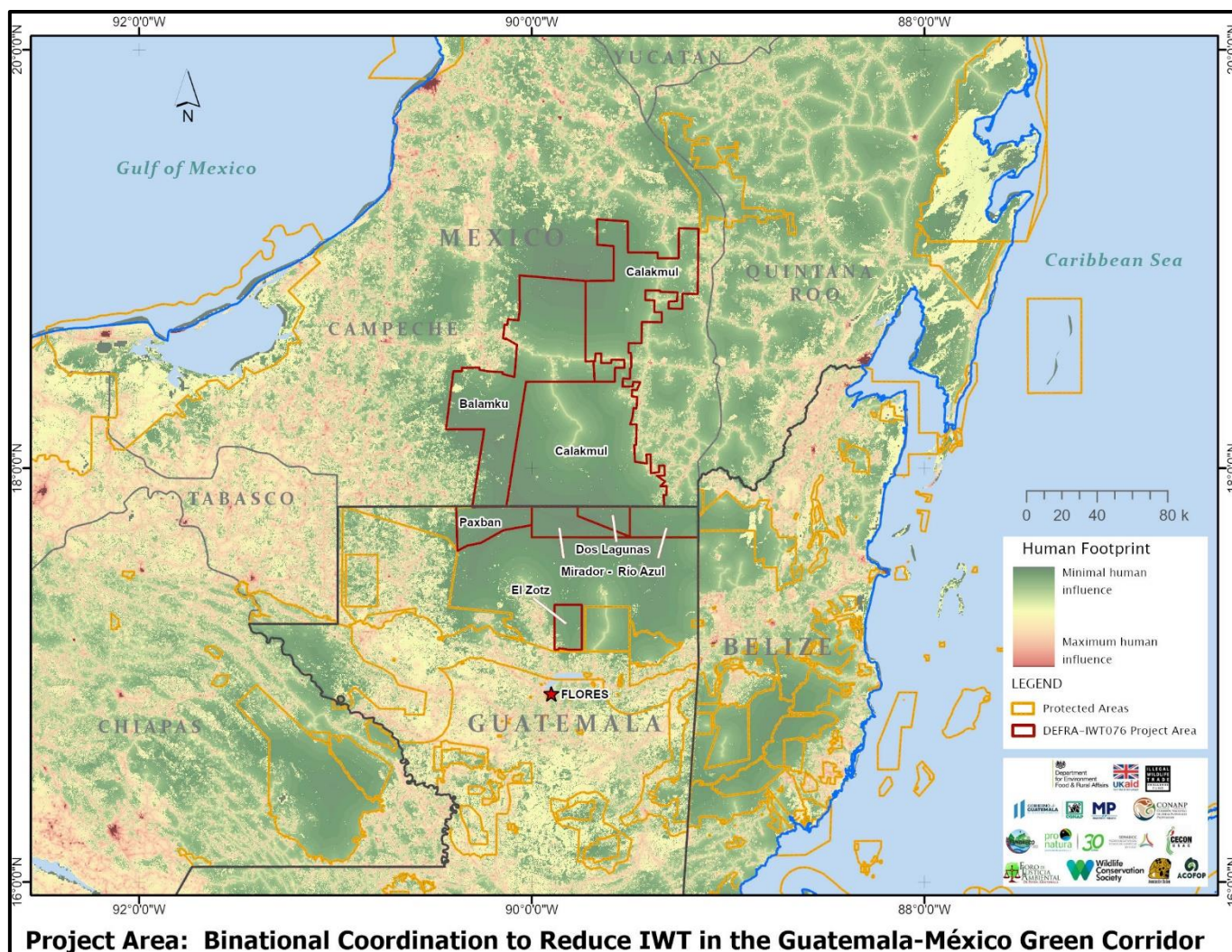
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from Mexico's National Council of Natural Protected Areas (CONANP) reported that the Calakmul Biosphere Reserve and Balamku State Reserve were also being severely impacted by timber extraction. Initial reports suggested that the targeted extraction of the *granadillo* trees was in response to demand in Asia, and that timber poaching in Guatemala and Mexico was led by well-organized criminal networks that openly transported timber overland using harvest permits extended to Mexican ejidos. The timber was eventually exported via Mexican ports to international destinations that were unknown at the time of the project's initiation.

**Figure 1: Map of the "Guatemala – Mexico Green Corridor" IWT076 Focal Area**



During 2018 and 2019, timber trafficking syndicates opened roads, poached timber, and killed or poached numerous wildlife species. In adjacent sections of Mexico's Selva Maya, researchers discovered a jaguar corpse, missing paws, teeth, and reproductive organs. In Balamku, slaughtered Baird's tapir and king vultures were discovered as protected areas agencies struggled to respond. But *granadillo* remained the most sought-after resource in the protected areas of both countries, with occasional poaching events detected of other valuable timber species, including mahogany, ziricote, sapodilla, and Spanish cedar.



In April 2020, with the support of the DEFRA IWT Challenge Fund, the Wildlife Conservation Society (WCS), the Environmental Justice Forum of Peten (EJF), FUNDAECO, *Asociación Balam*, and *Pronatura Península Yucatan* (PPY) mounted a response to the increasing threat along both sides of the border. Civil society partners joined forces with government agencies in Guatemala including the National Protected Areas Council (CONAP), the Public Ministry's office of environmental crimes (MP), and government agencies in Mexico, including CONANP and the Environmental Secretariat of the State of Campeche (SEMABICCE). Shortly after the project began, CECON joined the team effort, strengthening their anti-poaching patrols to the El Zotz Biotope adjacent to Tikal National Park. Without an adequate response to this growing threat at the Guatemala-Mexico frontier, partners believed that IWT of timber and the associated opening of illegal roads penetrating deep into the heart of the largest intact block of forest in Mesoamerica would eventually open routes of uncontrolled access by poachers and illegal colonists alike. Such threats could easily decimate populations of spotted cats (jaguar/NT; ocelot/LC, and margay/NT), Yucatan spider monkey/CR, Yucatan black howler monkey/EN, Baird's tapir/EN, as well as northern mealy amazon/NT, red-lored amazon/NT, and white-crowned parrot/LC, among other commonly trafficked species.

## IWT076 Interventions

The IWT076 project supported an integrated, multi-pronged approach to tackle the complexities of trans-frontier timber poaching largely driven by international market demand. Partners leveraged 10 funding sources<sup>8</sup> and pursued 5 outputs to reduce illegal timber extraction and wildlife poaching in adjacent protected areas spanning 125 km of the Guatemala – Mexico frontier.

1. **Improved Protection against the Illegal Wildlife Trade (IWT):** Increased patrolling and technical support for field operations received 40% of the project's resources and constituted the central strategy for halting IWT as soon as possible. The greatest support for patrols was provided in Guatemala (80%, as the target country within the IWTCF portfolio), with a modest investment in Mexico (20%). Additional activities included training park guards in the use of the Spatial Monitoring and Reporting Tool (SMART), provision of equipment, production of IWT protection/patrolling protocols in Guatemala and Mexico, field patrols by bi-national teams along the Guatemala-Mexico frontier, and training park guards in Guatemala on social safeguards as related to law enforcement operations.

**Results:** During the project period, IWT events decreased by 91.2% in the Guatemalan focal area, and 62.7% in the Mexican focal area. These results were propelled by over 30,000 kilometers of field patrols during the 31-month project, an indicator of robust, sustained field presence in the area. “*Grupo Genesis*” park guards composed of members of FUNDAECO,

<sup>8</sup> U.S. Department of Interior's International Technical Assistance Program (ITAP) and their Selva Maya Environmental Governance Program provided sustained matching funds and technical support. Additional funding was provided by Global Conservation; the Overbrook Foundation; the Rainforest Trust Foundation; the Laguntza Foundation; the European Union's 5 Great Forests of Mesoamerica Program; The Canadian Wildlife Service (CWS-ECCC); the US Fish and Wildlife Service (USFWS); TNC-Mexico/USAID; and the World Wildlife Fund of Mexico (WWF).

CECON, and CONAP contributed 75% of the project's patrol effort, sustaining regular field presence across the most vulnerable sections of Guatemala's Mirador-Rio Azul National Park and the Dos Lagunas Biotope. Approximately 20% of the collective patrol effort was supported by *Pronatura Península Yucatan* (PPY) in coordination with CONANP and SEMABICCE in the Mexican protected areas of Calakmul Biosphere Reserve and the Balamku State Reserve; the final 5% of patrol effort focused on the Paxban management unit in Guatemala, immediately south of the Mexican border adjacent to the Balamku State Reserve. A total of 10 individuals were arrested by Guatemalan authorities, including seven (7) Mexicans engaged in timber trafficking (in May 2020), and 3 Guatemalans for wildlife poaching. No arrests were registered in Mexico. Patrols also resulted in additional disruptions of timber poachers in Guatemala (4) and Mexico (4), serving notice to poachers that the single large capture event of seven (7) Mexican poachers registered in May 2020 was not an anomaly.

2. **Greater Awareness of IWT amongst Authorities:** Project partners held IWT outreach events in Guatemala and Mexico and employed social media to raise awareness about IWT among governmental authorities, civil society organizations, local communities, and donors. Partners worked with national and international media/press outlets and developed baselines for awareness regarding IWT among authorities subsequently re-evaluated awareness in Guatemala. In Mexico, due to pandemic-related interruptions, we did not establish an awareness baseline as planned; the project adapted to undertake a pre-and-post IWT awareness survey during an outreach event with authorities.

**Results:** Partners delivered 14 outreach events about IWT in Guatemala and Mexico, as well as 104 pulses on social media platforms, generating 10,737 “likes” or positive responses. We also supported and/or documented 130 instances of press coverage, including a high-profile article produced by Insight Crime during 2022. Nevertheless, pre-and-post project surveys revealed that IWT awareness among national authorities did not increase significantly or persist during the project lifespan, principally due to high turnover among national authorities in both countries. In Guatemala, the percent of correct responses indicating IWT awareness among national authorities declined from 50.34% to 25.27% between the baseline and the final survey. In Mexico, the pre-and-post surveys at the final IWT outreach event conducted in 2022, indicated an increase of 40% in correct responses (from 17% to 57%), but we consider this increase to be potentially ephemeral based on the lessons learned in Guatemala.

3. **Increased Use of Legal Frameworks:** Prosecutions for trafficking in Guatemala were made possible by *Grupo Genesis*' persistent patrolling and detection of timber and wildlife poachers. After arrests, the Environmental Justice Forum of Peten (EJF) provided legal support to increase the efficacy of IWT prosecutions; the EJF also developed a report outlining opportunities for bi-lateral coordination on IWT between Guatemala and Mexico. In Mexico, PPY produced a technical study detailing the volumes of timber “legally” exported from southern Mexico, and an analysis of legal loopholes in the chain of custody of timber in southern Mexico with recommendations to reduce laundering of poached timber. The aforementioned studies were shared with authorities of both countries to advance a legal remedy to existing loopholes allowing illegal timber to be exported legally in Mexico.

**Results:** Partners delivered 10 arrests and legal sentences against traffickers in Guatemala, beginning with the “emblematic” arrest of 7 Mexican traffickers in May 2020, shortly after the project began. We obtained an average of 3.87 prosecutions annually, just below our goal of 4/year, however the frequency of timber trafficking and other illegal activities decreased considerably after the high-profile capture of May 2020. Legal sentences applied to Mexican traffickers included jail time in Guatemala (1 week), prison fees, fines totaling Q65,000 (£6,117), and expulsion from Guatemala. The technical studies in Mexico determined that significant opportunities exist to close legal loopholes allowing timber to be laundered in Mexico; they also determined that 56% of timber<sup>9</sup> exported from Mexico is destined for China, 12% each for Spain and South Korea, with smaller volumes exported to Hong Kong, Singapore, Japan, Panama, India, Vietnam, and France, respectively. In June 2021, Mexican authorities confiscated [27 containers of illegal timber](#) destined for China at the Port of Progreso, in the State of Yucatan; 25 of these containers consisted of *granadillo*, the target species of this project. Outreach with Mexican officials led by PPY helped propel the Mexican government’s passage of [Federal Decree 08/05/2023](#) in May 2023, reforming the national penal code to increase fines and jail time for illegal timber trafficking.

4. **Alternative Livelihoods:** WCS, ACOFOP, and PPY implemented 14 activities to increase access to sustainable, alternative livelihoods for rural populations in Guatemala as the main target, and in Mexico. Again, given the geographic focus of the IWTCTF on Guatemala, WCS and ACOFOP made tangible investments to benefit at least 100 households at risk to IWT in Guatemala, tracking the socio-economic impact over time. In Mexico, PPY set an ambitious goal of leveraging additional funding sources to benefit 500 households by the end of the project. Livelihoods investments by the UK IWT Challenge Fund in Guatemala were matched by additional support from U.S. DOI-ITAP, the Overbrook Foundation, the Laguntza Foundation, Canadian Wildlife Service, European Union, U.S. Fish and Wildlife Service and ACOFOP. In both countries partners aimed for at least 35% of the direct beneficiaries being female. In Guatemala, WCS, ACOFOP, and *Asociación Balam* also supported improved land tenure for the community of San Miguel, a community previously under threat of being evicted from their traditional lands within the MBR Multiple Use Zone.

**Results:** WCS and PPY produced assessments of viable sustainable livelihoods as alternatives to engagement in IWT for Guatemala and Mexico, respectively, and used these to guide project investments. In Guatemala, sustainable livelihoods investments included: (a) beekeeping for honey production and to increase ecological services/propel natural forest regeneration; (b) ACOFOP’s construction of a non-timber forest product (NTFP) sorting house or “*bodega*” in Cruce a la Colorada to increase the volume and quality of products such as xate, breadnut, and allspice; (c) poultry ranching led by women in San Miguel; and (d) day wages for participation in forest restoration projects. In Guatemala, WCS, CONAP, and new partner the Ministry of Agriculture, Ranching and Food (MAGA) developed a management

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<sup>9</sup> Not including the most common tropical hardwood species of mahogany (*Swietenia macrophylla*) and Spanish cedar (*Cedrela odorata*)

plan for honey production subsequently supporting 48 beekeepers, including 14 women. WCS and Rainforest Alliance teamed up to support 11 female chicken farmers in San Miguel, while most beneficiaries of forest restoration and NTFP harvesting were male. Overall, thirty-five percent (35%) of these investments supported women. Shortly after project initiation, WCS obtained IRB certification<sup>10</sup> and surveyed 104 households using an expanded Basic Necessities Survey (BNS) to evaluate household access to 27 essential goods and services, and we tracked per-household income obtained by project investments. By the end of the project, the number of households obtaining direct benefits in Guatemala increased to 231 families, however the final BNS+ survey was undertaken with 86 of the original 104 households (83%) due to the lack of BNS baselines in the newly added families. We determined that 71 of 86 households (82.6%) registered increases in their household BNS wellbeing indices, propelling an increase in the average BNS score from the baseline of 0.44 to 0.53 by the project's end, an average increase of 20.4% among Guatemalan households receiving livelihoods investments surveyed. The greatest gains accrued in household access to efficient wood burning stoves and a local medical clinic; major decreases occurred in access to a doctor (substituted by access to nurses/clinics) and household consumption of bush meat. Of the 27 variables monitored, access to 21 “basic necessities” increased over the 29-month evaluation period, and six (6) decreased. In November 2022, according to voluntary, informal estimates provided by Guatemalan beneficiaries, the average monthly household income was Q1,618 (£167). Despite implementation during the COVID-19 pandemic, the majority of local households either increased their household monetary income levels (39%) or remained stable (42%), whereas 19% reported decreases in income. During implementation, WCS and CONAP tracked direct benefits captured due to livelihoods investments, yielding the following gross income generated by each alternative livelihood during the project: (1) honey production (£94,155); (2) non-timber products (£57,810); (3) restoration day wages (£41,601), and (4) poultry ranching (£2,355). The final BNS survey revealed that 81.4% of household respondents recognized that the livelihoods investments were being provided as one component of the IWT076 project designed to reduce wildlife trafficking. In Guatemala, working under the “[Juntos por San Miguel](#)” alliance<sup>11</sup>, partners joined forces to support CONAP, obtaining the formal rescission of CONAP’s long-standing eviction order against the community of San Miguel, and subsequently advancing a formal agreement codifying the community’s rights to reside within and manage their traditional lands. Only one (1) beneficiary household in Guatemala was implicated in IWT, consisting of one (1) event of bush meat extraction by a resident of San Miguel after the project’s implementation period ended. In Mexico, PPY leveraged £117,277 of additional funding to strengthen sustainable livelihoods

<sup>10</sup> On December 11<sup>th</sup>, 2020, the WCS Institutional Review Board (IRB) approved the research plan entitled “Monitoring and evaluation of socioeconomic impact in the livelihoods of beneficiary families in the communities of the Carmelita Route, San Andrés, Petén”, REF# 20-50.

<sup>11</sup> *Juntos por San Miguel* includes: WCS; CONAP; the Ministry of Health and Public Assistance (MSPAS); the Ministry of Agriculture, Ranching, and Food (MAGA); the Municipality of San Andres, Peten; the Center for Conservation Studies of the University of San Carlos of Guatemala (CECON/USAC); ACOFOP; ProPetén; Naturaleza para la Vida (NPV), and Rainforest Alliance. These diverse entities are all working to support the Community Development Council (COCODE) of San Miguel.



alternatives of at least 500 households, with 20% of beneficiaries being female. We present detailed analyses of the economic and social benefits of livelihoods investments in **Annexes 1 & 2**.

**Increased Multi-sector Collaboration:** Partners pursued multiple collaborations to establish a foundation for a sustained cross-border alliance after the project's completion. We established a "IWT Network" including initial IWT076 partners and other actors identified during implementation, held regular coordination meetings using virtual technology, engaged with the GIZ-supported Selva Maya Executive Coordinating Group (GEC) and their associated operational group (GOC), supported annual exchanges among Mexican and Guatemalan park guards, and signed an MOU with multiple actors to sustain trans-frontier collaboration to halt IWT over the long-term.

**Results:** The IWT076 bi-national network with governmental and civil society partners entered into practice via exclusive communication channels to exchange information, and through periodic meetings to plan field strategies and adapt project strategies as required. Timely information exchanges led to at least two (2) successful interdictions in the field, including the emblematic capture of seven (7) Mexican traffickers in May 2020. Partners advanced trans-frontier collaboration through four (4) ranger exchanges led by FUNDAECO, CECON, CONANP, and SEMABICC, with additional support from WCS and PPY. WCS spearheaded a bi-national Memorandum of Understanding among non-governmental organizations (NGOs), with 14 signing the agreement to reduce IWT and sustain cross-border collaboration, including the addition of five (5) new partners.

## Lessons Learned

We present a concise review of lessons learned during the implementation of IWT076, with two specific foci. First, we describe lessons learned by our multi-institutional team during IWT076. Second, we compare these with the lessons learned during a similarly focused, bi-national project to halt IWT at the Guatemala-Belize adjacency zone (IWT014) executed by WCS and bi-national partners during 2014-2017. Finally, we provide recommendations for organizations and donors interested in addressing the illegal wildlife trade where it transcends national borders and where trans-frontier collaboration is essential.

- 1. Civil Society Engagement:** IWT076 partners concluded that civil society participation – via NGO technical and financial support – was crucial in obtaining the positive results during the project, with a special emphasis on the robust reductions of IWT “events” of timber and fauna registered in Guatemala (-91.2%), and Mexico (-62.7%), respectively. In Guatemala and Mexico both, governmental entities charged with the protection of natural reserves and biodiversity remain underfunded and understaffed, with frequent rotations of personnel that also affect their ability to respond to acute threats, especially those located in extremely remote areas seldom patrolled or visited by authorities. By comparison, NGO partners benefitted from stabile personnel and strong commitments to the areas of intervention. For example, in Mexico, *Pronatura Península Yucatán* (PPY) supported the Calakmul Biosphere Reserve’s

declaration in 1989 and now has a 33-year history of work in the area. In Guatemala, the Association of Forest Communities of Peten (ACOFOP) has been active since 1992, *Asociación Balam* since 2004, and FUNDAECO has maintained a presence in the Mirador-Rio Azul focal area since 2013. NGOs are also able to attract additional resources and sustain interventions after a project ends, as demonstrated through the leveraging of £306,362 of additional support during the project lifespan, above and beyond project matching funds.

2. **Multisector Collaboration:** The alliance of government institutions, national and international NGOs, and local community-based organizations was an important component of the project's approach. Two examples consist of the joint field patrols between NGO rangers from FUNDAECO, WCS, CONANP and natural resource police (DIPRONA) in Guatemala, and joint patrols by PPY, CONANP, and SEMABICC personnel in Mexico. On rare occasions, Guatemalan army and/or Mexican National Guard personnel accompanied field patrols with their own resources, but such patrols were inconsistent, providing a key area to improve in the future. A final example consists of collaborations between the Environmental Justice Forum (EJF) and the environmental prosecutor's office in Guatemala (i.e., the "*Ministerio Público*") that helped to ensure prosecutors were aware of the relevance of any major IWT cases. These included the emblematic case of seven Mexicans arrested at the border for timber trafficking, as well as a long-running case of timber trafficking in Tikal National Park, which in 2022 finally resulted in a conviction after six (6) years of legal delays and appeals. Regarding community participation, the prior and informed consent (PIC) approach employed throughout the project provided an opportunity to ensure that local community partners were aware of the main project goal – the reduction of IWT. In Guatemala, WCS obtained PIC through initial consultations with community leaders, subsequent conservation agreements ratified in community assemblies and signed by community leaders, and in some cases individual agreements signed with beneficiaries of alternative livelihoods investments including beekeepers (5 management units), chicken farmers (San Miguel), and forest restoration/agroforestry workers (Cruce a la Colorada). These community-based agreements, often negotiated with active participation of government representatives, set the stage for engagement with government in specific components, such as those related to honey production or forest restoration/agroforestry investments. We detected no negative repercussions from the transparent transmission of the project's goal (i.e., the reduction of wildlife trafficking), concluding that the benefits of greater local awareness about IWT far outweighed the risk of putting any local traffickers on notice of the project's intent.
3. **Cross-border Partnerships in Frontier Areas:** Whereas multisector (i.e., government, civil society, community) collaboration was essential to delivering impact, partners were equally committed to the engagement of actors on both sides of the border. This cross-border collaboration, initiated several years earlier by FUNDAECO, CECON, and CONANP, was expanded through the engagement of WCS, *Asociación Balam*, the EJF, and PPY, and finally ratified through a Memorandum of Understanding including eight (8) civil society organizations



based in Guatemala<sup>12</sup>, and five (5) in Mexico<sup>13</sup>. It is important to note that in this particular case of a Mexican “hub” of selective timber poaching driven by global demand, the interventions available in Guatemala consisted of improved protection and law enforcement, developing increased social resilience to IWT via alternative livelihoods, and raising awareness about IWT in Guatemala. However, partners also realized that without the support of Mexican stakeholders, particularly Mexican authorities, there would be no way to eradicate the pressure of trans-frontier IWT originating in Mexico. In the future, the influence of timber trafficking syndicates must be reduced at their “hubs” or proximate sources (i.e., in the Mexican Municipality of Candelaria) to reduce the pressure on Guatemalan timber over the long run, with Federal Decree 08/05/2023 providing a strong step in the right direction.

4. **Importance of Field Presence:** The increased field presence through persistent patrolling by partners in Guatemala (FUNDAECO, CECON, CONAP) and Mexico (CONANP, SEMABICCE, PPY) provided the most impactful results to reduce IWT during the IWT076 project. This assertion holds true despite the inconsistent participation of law enforcement authorities during patrols in both countries, the lack of captures/sentences of traffickers in Mexico, and modest sentences of traffickers obtained in Guatemala. In short, project partners concurred that robust patrolling in areas subject to IWT was the single most impactful intervention supported by the project. We urge conservation practitioners battling IWT in similar circumstances to ensure their IWT eradication strategies include well-funded, long-term field presence as a core strategy to stop trafficking, with an emphasis on interdiction before key species are killed or extracted from their natural environment.
5. **Rapid Field Protection Response:** Another key lesson learned on the Guatemalan side of the border is that the rapid and immediate response to organized timber poaching sent a clear message that Guatemala will not tolerate this type of illegal activity. The initial rapid response included field patrols and interdictions led by FUNDAECO, CECON, and CONAP prior to the IWT076 project, including one (1) disruption of poachers and the capture of two (2) individuals. Following the initiation of IWT076, Guatemalan partners delivered four (4) disruptions and nine (9) captures of poachers over project period, accelerating the field response. This rapid response helped avoid a vast expansion of the trafficking syndicates into Guatemala and avoided an associated expansion of timber trafficking roads for future poach-and-run operations. By contrast, in Mexico timber trafficking had been ongoing for years, decimating the populations of key species such as *granadillo* in the Balamku and Balamkin State Reserves, leaving only the Calakmul Biosphere Reserve as a significant “protected” source of the species. At the same time, timber trafficking had become lucrative enough to draw the attention of major organized crime syndicates capable of weakening government resolve. This absorption of timber as a key source of income for organized crime syndicates constituted a major point of inflection in Mexico, beyond which even federal intervention had become tenuous. For example, in August 2019, Mexican authorities confiscated trucks full of timber on several occasions, only to have them [set ablaze by the traffickers](#) or be released when well-

<sup>12</sup> In Guatemala: ACOFOP, ARCAS, *Asociación Balam*, *Defensores de la Naturaleza*, FUNDAECO, and the EJF.

<sup>13</sup> In Mexico: [ANCI](#), *ECOSUR*, *Natura Mexicana*, PPY, and WWF-Mexico.

organized gangs retained law enforcement personnel. In Guatemala, organized crime syndicates had not yet influenced national authorities *vis-a-vis* the Guatemala-Mexico Green Corridor, improving the likelihood of obtaining political support for rapid action.

6. **Long-term Commitment:** The IWT076 project spanned 31 months, providing Guatemala-Mexico Green Corridor partners with a crucial and timely injection of resources, resulting in a significant reduction in timber and wildlife poaching. Partners must now sustain efforts for at least for another decade if not more, while also expanding interventions to meet the challenges identified above. As previously mentioned, FUNDAECO, PPY, CECON, CONAP, CONANP, and SEMABICC all have long-term commitments to the project focal area, which will help sustain IWT076 advances. Civil society partners FUNDAECO, PPY, ACOFOP, EJF, Balam, and WCS have all obtained additional resources through sustained fundraising, allowing many IWT076 activities to persist, particularly as related to field patrols and alternative livelihoods. Nevertheless, in the future, the DEFRA IWT Challenge Fund may also consider the possibility of inviting select projects to apply for a second phase of funding to consolidate projects demonstrating impact and success. This continued support would not only help sustain core interventions (i.e., field patrols), but could also help implementers conclude policy interventions that typically require more time – such as the planned bi-national meeting and improvements in timber traceability and permitting systems to reduce illegal timber laundering.
7. **Law Enforcement and Legal Deterrents:** Whereas field protection efforts delivered important reductions in natural resource trafficking in Guatemala and Mexico, judicial sentences delivered in both countries remained modest, providing additional area for improvement in the future. We registered no captures, prosecutions, or judicial sentences of timber traffickers in Mexico during the project period as a direct result of project interventions. However, recently [confiscations of trafficked timber have increased](#), and the [recent capture](#) of three (3) timber traffickers near the Calakmul Biosphere Reserve indicates greater attention by Governor Sansores of Campeche and Mexican Federal authorities, as does the recent passage of Decree 08/05/2023, increasing fines and jail time for timber traffickers. By contrast, in Guatemala, despite judicial sentences, fines, and jail time levied against the seven (7) Mexican timber traffickers captured in May 2020, deterrents remained modest when contrasted with the total economic loss to Guatemala from the poached timber. One potential remedy may consist of modifying national sentencing statutes, such that foreign individuals captured for IWT-related offenses pay higher “compensation” fines instead of simply increasing jail time. This type of stiffening of the consequences for IWT by foreign traffickers could help Guatemala avoid the costly maintenance of non-Guatemalans in jail, while increasing funding that can be awarded by courts for use by national authorities charged with defending natural resources. Nevertheless, several hurdles exist to such improvements. First, modifying national penal codes can be a lengthy, complicated process often requiring legislative approval. Second, effective use of remediation fines would also require sustained outreach with sentencing judges to encourage them to direct funding to protect areas impacted by IWT.
8. **Sustained and Targeted Public Outreach:** An important lesson reinforced during the IWT076 project is outreach on IWT must target new decision makers as they emerge to lead

governmental institutions. Surprisingly, between our initial and final awareness surveys, we registered a 50% decrease of awareness about IWT among Guatemalan government representatives, in part due to a 48% turnover (10 of 21) in staff between the baseline and final surveys. This decrease occurred despite the aforementioned 14 outreach events, 104 social media pulses on IWT, and 130 instances of press coverage, including a [high-profile article](#) produced by Insight Crime in English and Spanish. Substantial turnover of governmental personnel is commonplace in many IWT source countries; developing a more effective approach to remedy low awareness about IWT among officials should be a priority in future projects. Notably, the lack of a connection between the “high” amount of social support for combatting IWT as demonstrated through the number of “likes” on Facebook and the (low) awareness of governmental personnel suggests that, in this case, it would have been more impactful to increase outreach targeted directly at decision makers with the ability to support IWT interdiction efforts. Finally, when working in a consortium, it is essential to ensure partners deliver the same message shaped by strategic talking points that are adjusted as we learn and as conditions change. Key points for outreach should also be developed/shared with UK Embassy officials, particularly when engaging national government officials.

**9. Engagement of Women:** Project partners attempted to engage women throughout, including within training on the use of the Spatial Monitoring and Reporting Tool (SMART) during field patrols. We considered female engagement in sustainable livelihoods projects as particularly relevant, since [women typically invest a greater percentage of their earnings in the household](#) – leading to greater advances in household wellbeing. Both WCS (Guatemala) and PPY (Mexico) employed women to lead community outreach and implementation of livelihoods activities, in theory increasing the confidence among rural women that their perspectives would be considered. That said, partners were cognizant that the participation of women in some activities (i.e., patrolling and law enforcement) is uncommon, so instead of setting hard quotas or obligating female participation in such cases, we opted instead for employing messaging welcoming women interested participating in activities typically dominated by men. One result of this approach was the participation of four (4) female natural police officers (DIPRONA) in the SMART training held in Guatemala. We provide specific recommendations for the engagement of women in the final section of this paper.

**10. Integrated, Multidimensional Interventions:** The integrated approach taken to reduce IWT in the project area included five outcomes, three of which provided immediate, tangible results for actors directly responsible for halting IWT (i.e., improved protection, improved use of legal frameworks, and multi-sector collaboration). Two additional outcomes (greater awareness of IWT, alternative livelihoods) helped expand the range of stakeholders engaged and advance social support for reducing IWT. Partners applied this integrated approach, with particular emphasis on increasing social resilience to trafficking through alternative livelihoods and the engagement of women at the local level. As noted previously, direct investments in alternative livelihoods in Mexico remained beyond the scope of this project. Nevertheless, during the project PPY did leverage £117,277 of additional resources to support alternative livelihoods for families exposed to IWT in the Mexican project area. This initial commitment to support



families living near the hub of the organized crime syndicates in control of timber trafficking in the area will most certainly have to expand in the future to effectively reduce the allure of trafficking. In Guatemala, however, the pressure on communities to engage in IWT was far lower due the distance of the syndicates in Mexico, and the project was able to invest directly in alternative livelihoods, delivering a 20.4% increase in access to basic necessities as well as the multiple benefits detailed above. In summary, the integrated model of IWT-related interventions ensured that the project engaged across the multiple dimensions impacted by IWT and received the support of a broad range of stakeholders, including local communities.

**11. Bilateral Government Support and Alignment with Public Policy:** The IWT076 team confirmed the importance of collaboration between Guatemalan and Mexican authorities. Examples include the joint border patrols between Mexican government rangers from CONANP and SEMABICCE, and Guatemalan government personnel from CONAP and DIPRONA. This local coordination between federal and state agencies helped deliver the substantial reduction in timber and wildlife poaching in Guatemala. Partners also aligned project interventions with national policy objectives to propel binational engagement. For example, the EJV and *Asociación Balam* engaged Guatemala’s Ministry of Foreign Relations, CONAP, and the *Ministerio Publico*, obtaining commitments to reinforce governmental initiatives advancing through the respective agencies of both countries, including a MOU between CONANP and CONAP. In Mexico, PPY and WCS shared project goals and engaged personnel from CONANP’s headquarters in Mexico City, the Governor of Campeche, the Federal Environmental Prosecutor’s Office (PROFEPA), the Secretariat of the Environment (SEMARNAT), and the National Commission for Forests (CONAFOR). In so doing, we advanced three outputs: (1) Federal Decree 08/05/2023 stiffening penalties for timber trafficking; (2) The bilateral MOU between CONAP-CONANP with a specific clause detailing collaboration on trans-frontier IWT; and (3) A formal meeting between the relevant agencies of each country to increase collaboration and establish direct line of high-level coordination to combat timber poaching in the area. To date, government partners continue working on both outputs, highlighting the need for long-term engagement when such high-level policy interventions are required. Finally, regarding public policy, project partners recommend that Guatemalan and Mexican biodiversity agencies propose listing the species most in demand (i.e., “*hormigo*”; *Platymiscium yucatanum*) in CITES Appendix III.

**12. Track Press Narratives:** PPY and partners in Mexico noted that press narratives evolved over time, providing partners with an indirect yet informative way to track the overall sentiment towards timber trafficking, as well as the opportunity to engage governmental partners and press when narratives were imprecise. For example, in May 2021, despite some high-profile reports of timber trafficking most Mexican media continued to report a lack of evidence of timber trafficking. By July 2021, media coverage shifted to include more evidence of confiscations and allegations of institutional corruption. But by late 2022, several stories mentioned the new commitment to eradicate illegal timber trafficking by the Governor of Campeche, Mrs. Layda Sansores, demonstrating the favourable evolution in the public’s awareness of IWT over time. A final comment is that in some cases press narratives were

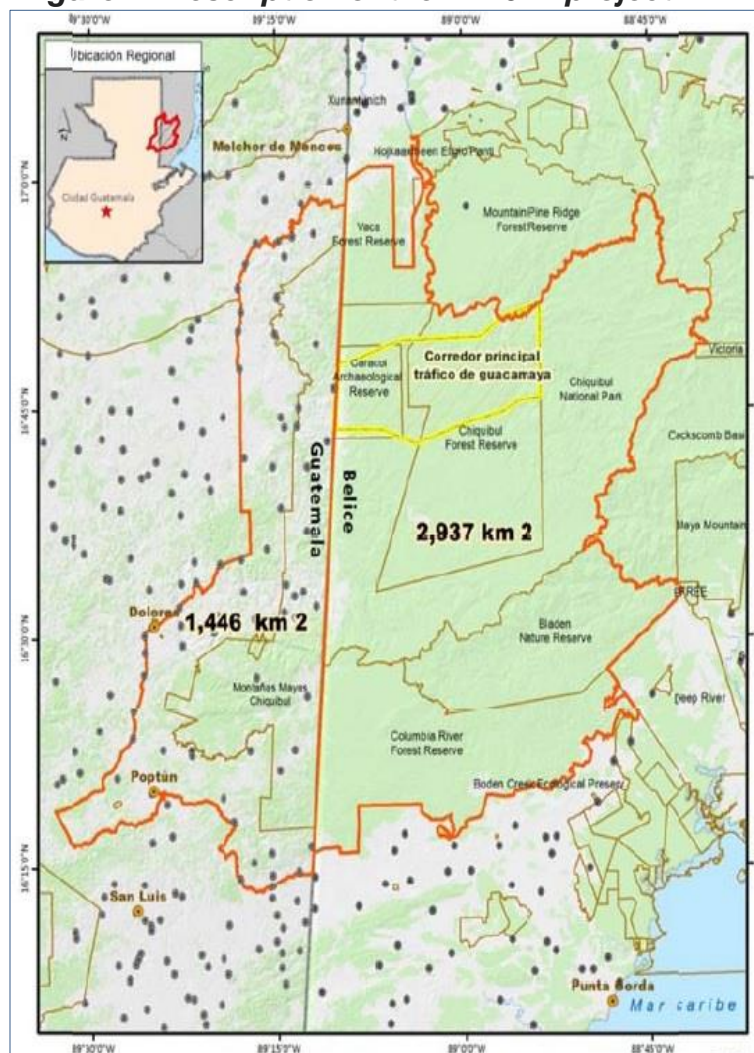
inaccurate, for example mis-identifying the species under threat as ‘dyewood’ or “*palo tinto*”, providing project staff with a key point for outreach with decision makers.

## Comparison of Lessons Learned: IWT014 and IWT076

The IWT014 project (**Figure 2**) was implemented from 2015-2017 along the Guatemala-Belize Adjacency Zone to eradicate trans-frontier trafficking with a focus on scarlet macaws as the main target species, while also providing secondary benefits to additional fauna and flora including parrots, monkeys, felids, and valuable timber species.

At the same time, some important differences existed between IWT014 (Guatemala – Belize), and IWT076 (Guatemala-Mexico). Differences included: (a) Timber trafficking in Mexico is led by organized crime syndicates facilitating timber trafficking in response to international demand, whereas the scarlet macaw trafficking was driven by less organized, small-scale illegal activity associated with the largely national pet trade; and (b) Guatemala was the “hub” or source site of the pressure on macaws within IWT014, whereas Mexico was the “hub” for the timber trafficking addressed by IWT076.

**Figure 2: Description of the IWT014 project**



The project “*Bi-national Collaboration to Eradicate Wildlife Trafficking in Belize and Guatemala*”, funded by the UK Government’s Illegal Wildlife Trade Challenge Fund, was implemented from 2015 to 2017 to improve government and civil society capacity and collaboration to tackle cross-frontier wildlife trafficking in the Chiquibul-Maya Mountains ecoregion. Implementing partners in Guatemala included the Wildlife Conservation Society (WCS), the Government of Guatemala’s National Council of Protected Areas (CONAP); *Asociación Balam*; and the Environmental Justice Forum of Petén (EJF). In Belize, partners included Belize’s Ministry of Agriculture, Forestry, Fisheries, Environment and Sustainable Development, and Friends for Conservation and Development (FCD). Interventions included: (1) Strengthened enforcement to detect and arrest poachers in Belize; (2) Improved intelligence and prosecution of wildlife traffickers in Guatemala; (3) Increased cross-border and cross-sector coordination on wildlife trafficking; (4) Improved livelihood alternatives for men and women in rural communities along wildlife trafficking routes in the Guatemalan Adjacency Zone; and (5) Increased awareness about IWT in Guatemalan communities adjacent to Belize and among Guatemalan authorities.



**Figure 3: Lorena Pérez and Elsa Contreras of San Miguel la Palotada engaged in forest restoration activities within the IWT076 project.**



**Table 1**, below, summarizes lessons learned during the implementation of both projects, expanding on implications that may be of relevance to conservation practitioners, governments, and donors alike when grappling with the complex issue of trans-frontier IWT. For each project, we classify lesson as either: “**Foundational**” = the cornerstone without which action to reduce IWT would be unlikely to occur; “**Essential**” = led to measurable impact, without which the specific goals of the project could not have been obtained; “**Important**” = provided measurable contributions to the intervention strategy, however many of these (i.e. social awareness of IWT, investments in sustainable livelihoods) provided indirect and/or long-term investments, making their immediate contribution to reducing IWT more difficult to measure during the timeframe of a 3-year project; and “**Helpful**” = increased support for the project and expanded stakeholder participation, but without delivering measurable results to IWT trends in the field.



**Table 1: Lessons Learned during IWT014 (Guatemala-Belize) and IWT076 (Guatemala-Mexico)**

Lessons Learned		IWT014	IWT076	Observations
1	Civil Society Engagement	Foundational	Foundational	Governments in all three countries lacked the resources and personnel to respond to IWT adequately, and were often subject to significant turnover, challenging their abilities to sustain anti-IWT interventions. CSO partners designed intervention strategies (with government), compensated for governmental limitations vis-a-vis IWT, increased multi-sector support to respond to IWT adequately, and sustained efforts post project. Both projects highlighted that CSO engagement was the cornerstone of more effective IWT intervention strategies in the field.
2	Multisector Collaboration	Essential	Essential	Alliances between local communities, civil society, and government propelled significant social support to halt IWT in Guatemala, Belize, and Mexico. See also #5 below.
3	Cross-border Partnerships at Frontiers	Essential	Essential	Actors engaged on both sides of each frontier helped address trans-border IWT, with source country-actors best engaged to implement field patrols to stop IWT "before the killing" or extraction occurs, which is far preferable to confiscating wildlife and natural resources post extraction.
4	Importance of Field Presence	Essential	Essential	Strengthened patrolling and field presence within IWT source sites was the single most impactful intervention in both projects. Given the urgency of IWT-related biodiversity loss across the globe, partners urge all actors interested in halting IWT to ensure robust field investments are included in any major project addressing IWT.

Lessons Learned		IWT014	IWT076	Observations
5	Rapid Field Protection Response	Essential	Essential	Macaw poaching had occurred in Belize for years prior to the IWT014 intervention, whereas the latest wave of timber poaching in Guatemala that originated in Mexico initiated in 2018. Despite the slow response in Belize, partners agreed that immediate action, facilitated by persistent patrolling and timely detection, is essential to curb IWT before impacts expand and/or IWT pressures open areas to other threats such as deforestation and illegal colonization.
6	Long-term Commitment	Essential	Essential	Both projects obtained vast reductions in IWT of target species, yet partners concurred that if field protection and other integrated approaches are curtailed, IWT would once again increase significantly.
7	Law Enforcement and Legal Deterrents	Essential	Important	Effective law enforcement providing a legal deterrent was an "essential" component of the IWT014 project, as demonstrated by several captures of Guatemalan macaw poachers by Belizean authorities, resulting in fines and jail time. In the case of IWT076, we obtained no captures in Mexico and 9 in Guatemala, yet legal sentences provided only a modest deterrent. Nevertheless, the passage of Federal Decree 08/05/2023 nearly 6 months after the end of IWT076 implementation suggests that stronger legal deterrents may soon decrease the allure of timber trafficking in Mexico, while also indicating that policy interventions often require more time to reach fruition.

Lessons Learned		IWT014	IWT076	Observations
8	Sustained and Targeted Public Outreach	Essential	Important	Public outreach focused on decision makers was more effective in the case of both Guatemalan and Belizean authorities within the IWT014 project. Federal prosecutors from the <i>Ministerio Público</i> supported investigations into macaw traffickers in Guatemala, leading to arrests. As previously noted, outreach with Guatemalan decision makers in the IWT076 project failed to raise their awareness about IWT significantly (largely due to staff turnover). Partners concluded that persistent, specifically tailored outreach targeting governmental decision makers will increase the efficacy of outreach in the future.
9	Engagement of Women	Important	Essential	The IWT014 project did not analyze the impact of female engagement, but within IWT076 project partners made a concerted effort to increase female participation, particularly within sustainable livelihoods interventions.
10	Integrated, Multidimensional Interventions	Important	Important	The integrated and multidimensional interventions implemented to IWT addressed diverse weaknesses allowing IWT to affect both frontiers. Rural livelihoods investments targeting vulnerable human populations helped cultivate greater social tolerance/support of field interdiction activities, while also responding to government priorities for investment in their constituent communities. However, livelihoods investments typically require time to become transformative; they also sometimes fail to be sustained. Other actors can also be recruited from outside a community to act as poachers. For these reasons, we considered such investments as "important", but not "essential".



Lessons Learned		IWT014	IWT076	Observations
11	Bilateral Government Support and Alignment with Public Policy	Helpful	Helpful	In both projects, support from, and engagement of, governments on both sides of the border was helpful. However, governments from IWT source countries were typically more interested in solutions, while governments from IWT destination countries (IWT "hubs") tended to be less responsive. Alignment with public policy goals of national governments was helpful in obtaining government support but did not guarantee government prioritized IWT and expedited project outputs. Bilateral engagement between Guatemala and Mexico was more productive in the field, whereas the resolution of Adjacency Zone issues between Guatemala and Belize has complicated sustained collaboration after the IWT014 project ended. Even so, the alignment of IWT014 interventions with a 2014 MOU signed by both Guatemala and Belize helped ensure that some collaborations were viable. UK Embassy support was also helpful in building bridges with national authorities, especially in Guatemala.
12	Track Press Narratives to Guide Outreach	N/A	Helpful	Particularly in Mexico, tracking the evolution of press coverage of IWT (timber trafficking) helped project partners determine the degree to which IWT had become officially recognized as a real threat, and to demonstrate the degree to which authorities were taking the threat seriously by mounting responses.



## Recommendations

We provide concise recommendations distilled from the collective experiences obtained during six (6) years of IWT intervention efforts transcending Guatemala's national borders. We categorize recommendations within the framework outlined above, including additional recommendations provided at the end despite not being clearly aligned with a major lesson learned. It is our hope that these recommendations will be of value to all individuals interested in responding to the ever-growing pressure of trans-frontier wildlife trafficking, especially since in many parts of the globe the larger, intact wildland refuges and their associated natural resource stocks are located along, or very close to, national frontiers.

Lessons Learned	Specific Recommendations
Civil Society Engagement	<ul style="list-style-type: none"> <li>Invest in Civil Society Organizations (CSOs) and Non-governmental Organizations (NGOs) to reduce IWT in source countries.</li> <li>Ensure that CSOs/NGOs implement diversified anti-IWT strategies that engage diverse sectors of society if the local context allows.</li> <li>Maintain government informed of interventions and challenges, especially those related to issues of national sovereignty.</li> </ul>
Multisector Collaboration	<ul style="list-style-type: none"> <li>Engage multiple stakeholders and social sectors using a multi-faceted intervention approach spanning government, CSOs/NGOs, and community-based organizations. The broader the anti-IWT alliance, the greater the potential to sustain social and political support over time.</li> <li>Ensure the participation and in many cases leadership of project interventions by national CSOs/NGOs. This ensures local appropriation of efforts to reduce IWT, thereby increasing the potential for long-term sustainability of project interventions.</li> <li>Recognize that some interventions provide immediate impact (patrolling, law enforcement), whereas others help increase the social viability of anti-IWT interventions over time.</li> </ul>
Cross-border Partnerships at Frontiers	<ul style="list-style-type: none"> <li>If possible, engage partners on both sides of a national frontier impacted by IWT, particularly if an IWT “hub” or demand center is located on one side of a border, and the other side if the border is a source site for poached resources.</li> <li>Formalize a trans-frontier network of organizations committed to eradicating IWT over the long-term through an MOU outlining shared goals and a long-term commitment to sustain the partnership.</li> <li>Develop discrete methods for sharing sensitive information across borders, with an emphasis on intelligence regarding locations under threat and potential interdiction strategies.</li> <li>Undertake joint patrols of border areas with partners from both countries.</li> <li>Support park guard exchanges among field rangers from both countries.</li> </ul>

Lessons Learned	Specific Recommendations
Importance of Field Presence	<ul style="list-style-type: none"> <li>Develop robust field presence in an IWT-source site, emphasizing constant patrolling of vulnerable areas and associated data collection to map IWT “hot zones”. Target hot zones for regular patrolling, leaving evidence of the presence of guards as a warning to poachers.</li> <li>Sustain field presence and patrols even if there is low capacity/inability to capture traffickers.</li> <li>Use the Spatial Monitoring and Reporting Tool (SMART) to register efforts and threats encountered, and to gauge trends in IWT pressure and focus field effort more effectively.</li> <li>Obtain “disruptions” of poaching/trafficking – for example, scaring away poachers from a field encampment and/or the confiscation of their supplies and equipment – to increase the cost of IWT trafficking to syndicates, particularly when arrests are not viable.</li> <li>Ensure that increased patrolling and field presence occurs on both sides of a border, not only in areas subject to IWT extraction, but also in areas where poached resources are transported to demand “hubs”.</li> </ul>
Rapid Field Protection Response	<ul style="list-style-type: none"> <li>Respond to IWT with increased field presence and/or law enforcement as quickly as possible.</li> <li>Enable rapid response and effective field presence by ensuring field staff have access to effective communication systems when operating in extremely remote areas, and that field vehicles are well maintained as an essential component of effective protection.</li> <li>If supportive, inform national authorities of new IWT incursions, new IWT target species or markets detected as soon as possible.</li> <li>Avoid at all costs, if viable, the penetration of previously inaccessible areas through the construction of new access routes/roads.</li> </ul>
Long-term Commitment	<ul style="list-style-type: none"> <li>Plan on (at least) decade-long engagement in areas subject to high value IWT and/or global demand that is unlikely to wane quickly.</li> <li>Ensure partners on both sides of the border are committed to long-term engagement beyond the lifespan of any single funding source.</li> <li>Engage governments as long-term partners, if appropriate.</li> <li>Sustain community-based interventions including improved livelihoods investments over the long-term; short-term livelihood interventions rarely deliver transformative impact over the long-term.</li> <li>Include language regarding long-term commitments within any MOU signed to sustain anti-IWT across frontiers and/or within national jurisdictions.</li> </ul>





Lessons Learned	Specific Recommendations
Law Enforcement and Legal Deterrents	<ul style="list-style-type: none"> <li>Engage national authorities to enforce the law, arrest poachers, and obtain legal sentences of individuals engaged in high-value, syndicated IWT networks.</li> <li>Prioritize the capture and prosecution of powerful traffickers linked to global demand, rather than focusing on minor violations related to wildlife poaching for subsistence in areas affected by high-value (timber) trafficking. While it may be advisable to avoid advocating that governments apply the full weight of the law for minor IWT violations in certain cases, it is essential to address the root causes of illegal logging and wildlife trade by targeting the most powerful actors in the illegal timber market, including high-level operatives within trafficking syndicates.</li> <li>In cases where legal deterrents are inadequate (fines and/or jail time), formulate a long-term outreach strategy to increase federal/national support, including engagement with prosecutors and judges to request maximal penalties where warranted, and potentially modify penal codes if deterrents remain anemic.</li> </ul>
Sustained and Targeted Public Outreach	<ul style="list-style-type: none"> <li>Develop and sustain targeted outreach campaigns focused on key decision makers, especially when new government personnel assume key posts responsible for anti-IWT interventions.</li> <li>Where possible, promote improved governmental engagement by addressing the needs and perspectives of government officials.</li> <li>Track public narratives in press/media to guide outreach, and measure awareness about relevant IWT issues among decision makers over time.</li> <li>Measure the effectiveness of IWT outreach with relevant actors using pre-and-post training surveys.</li> <li>Eschew broad scale outreach campaigns as the only/central IWT outreach activities, opting instead for more targeted outreach with decision makers/community leaders able to influence field action and national policy.</li> </ul>
Engagement of Women	<ul style="list-style-type: none"> <li>Support female participation across all project components, including those typically considered the dominion of male stakeholders (i.e., some field-based activities such as forest restoration, law enforcement, etc.).</li> <li>Ensure project planning and viability analyses such as those developed for sustainable livelihoods, consider from the beginning alternatives that increase the viability of female participation.</li> <li>Analyze each component of a project and set culturally appropriate goals/targets regarding female participation, with the goal of increasing the participation of women when viable.</li> <li>However, avoid setting specific quotas or thresholds that “obligate” or artificially inflate female participation in specific components just to meet project targets.</li> <li>Ensure women are aware that livelihoods investments originate from a project designed to reduce IWT, undertaking outreach with women during the inception stage to inform them of locally relevant IWT issues, including the overarching goal of project investments and risks for family members if they participate in IWT.</li> </ul>



Lessons Learned	Specific Recommendations
Integrated, Multidimensional Interventions	<ul style="list-style-type: none"> <li>• Incorporate investments in sustainable livelihoods in cases where rural populations engage in IWT as a livelihood strategy.</li> <li>• Utilize prior and informed consent (PIC) methods, including Conservation Agreements and/or formal MOUs, to ensure local communities are aware of the explicit link between social investments benefitting local communities, and the intended goal of reducing IWT.</li> <li>• Produce a rapid, participatory evaluation of potential livelihoods investments prior to selecting project investments.</li> <li>• Evaluate the impact of social investments by monitoring gross income/tangible benefits at the household level.</li> <li>• Where possible, develop long-term baselines for household wellbeing to gauge impact of socioeconomic investments beyond a project's lifespan.</li> </ul>
Bilateral Government Support and Alignment with Public Policy	<ul style="list-style-type: none"> <li>• Work to build bridges between national governments and their respective agencies where viable.</li> <li>• Inform the Ministries of Foreign Relations of ongoing IWT issues at frontiers and ensure they are updated as projects advance. Keep in mind that officials of countries impacted by trans-frontier IWT are likely to be more eager to engage/act than officials of countries reaping the benefits of natural resources poached from neighboring countries.</li> <li>• Characterize project investments to increase formal, governmental trans-frontier collaboration to halt IWT as a way to implement pre-existing national policies and/or regional/international commitments.</li> <li>• Focus bridge building between national governments at diverse levels, including high-level governmental officials, mid-level technical staff, and field technicians/park guards.</li> <li>• Identify key policy weaknesses facilitating IWT and commit to addressing these through sustained outreach and long-term support, including inclusion of targeted species in CITES.</li> <li>• Where viable, engage United Kingdom Embassy personnel during the implementation of any trans-frontier IWT project implemented by the IWTCF, as demonstrated through the UK's support during IWT076 to engage national Ministries (i.e., Ministry of Foreign Relations, Ambassador of Mexico in Guatemala, other Ministries and Secretariats).</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Standardize socioeconomic data collection using software such as Kobo Toolbox, to increase the comparability of data collected in the future.</li> <li>• Ensure project investments, particularly livelihoods project, engage women – since women rarely benefit from/participate in field protection activities. This ensures awareness of IWT issues among women and helps to disseminate awareness about IWT within rural households.</li> <li>• Use press and media to simultaneously track national narratives about IWT and develop outreach materials to increase support for IWT interdictions by decision makers.</li> </ul>



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**Figure 4: Poultry ranching, honey production, the non-timber forest product bodega in Cruce a la Colorada, America Rodriguez in action, and agroforestry restoration during IWT076.**





## Annex 1: Impacts of IWT076 Sustainable Livelihoods Investments

We provide a rapid evaluation of the key outcomes of sustainable livelihoods investments in Guatemala under the aegis of the IWT076 project. The analysis is structured around the following guiding questions:

1. **Economic Return on Investment:** which livelihoods investments yielded the most favourable rates of Return on Investment (ROI) through income generation and/or benefit capture by local households?
2. **Sustainability:** how likely is each livelihood investment to continue yielding benefits for rural households after the project?
3. **Gender equity:** which livelihoods investments maximized the opportunities for women to receive income and/or tangible benefits?
4. **Additional benefits:** What additional benefits accrued due to livelihoods investments?
5. **Conclusions:** What are the main recommendations for those supporting sustainable rural livelihoods to reduce the lure of IWT or advance conservation goals?

### 1. Return on Investment (ROI) & Benefit Capture by Rural Households

We analysed the ROI of each livelihood considering the following factors:

- (a) The “**gross income**” generated by each supported livelihood or industry during the project lifespan.
- (b) The number of beneficiary households supported by each livelihood investment.
- (c) The average income from each livelihood for each beneficiary household.
- (d) The “types” of costs and amounts invested within three categories of investment in sustainable livelihoods:
  - i. The amount of “**direct investment**” in each livelihood – consisting of investments received by beneficiary households, including daily wages, equipment, and supplies and materials.
  - ii. The “**delivery costs**” of each type of livelihoods support – including technical assistance, travel and per diems, workshops, meetings, and consultancies.
  - iii. Other “**programmatic costs**” – including office costs, administrative costs, managerial costs, and overhead.
- (e) The sources and amount of investment in support of each livelihood
  - i. IWT076-DEFRA investment in sustainable livelihoods; and
  - ii. Total investment in sustainable livelihoods (IWT076 + match/leveraged).
- (f) The “**net income**” captured by beneficiaries (i.e., the income from each livelihood that was directly attributed to IWT076 and/or leveraged investments, including both monetary income and the estimated value of any additional benefits such as agricultural products).

We detail the **Return on Investment (ROI)** for each livelihood in **Annex 2**; we present ROI as the value in Pounds Sterling generated by each livelihood over the 31-month project period for each Pound invested via the IWT076 project. We distinguish between the “gross” and “net” ROI obtained by rural households from each sustainable livelihood option. In the former, a project may provide support to a beekeeper already engaged in production and subsequently report the

beekeeper's total production/income. This “gross” figure, however, certainly over-represents project impact by not accounting for production that would have occurred anyway had the project not intervened. Accordingly, we make a distinction between the “gross” return (i.e., described above), and the “net” return, which we defined as the amount of production/income from each livelihood that could be justifiably ascribed to the project. For example, in the cases of honey (75%) and the NTFP bodega (79%), most of the production would have occurred irrespective of IWT076. However, restoration payments and poultry ranching initiated as a part of the IWT076 project, including both DEFRA and leveraged funds; we thus considered that 100% of the income generated by these two livelihoods were the direct result of project support.

**Table A1.1: Percentages and Details of Livelihoods Incomes Ascribed to IWT076**

Livelihood	% Income Ascribed to IWT076	Details
Apiculture	25%	IWT076 support included: a) supporting new beekeepers, b) training on disease prevention, c) provision of supplies and materials, d) support with marketing. Participatory evaluation of 48 beekeepers led to a final estimation of 25% of the total production being directly attributable to the IWT and partner investments.
Restoration/Agroforestry	100%	Forest restoration and/or agroforestry investments were established and led by the IWT076 project and did not occur previously. This led us to register all restoration and/or agroforestry income as a direct result of the project.
NTFP Management	21%	The Association for Integrated Forestry of Cruce a la Colorada (AFICC) managed/sold non-timber forest products prior to the project. ACOFOP, AFICC, and WCS used IWT076, DOI, and Arcadia Foundation support to build an NTFP sorting warehouse and storage “ <i>bodega</i> ” that helped reduce NTFP waste and product loss, ensure a clean/safe space for product storage, and provide an incentive to engage in a harvest when market demand existed. The <i>bodega</i> subsequently helped AFICC obtain “Mayacert” certification for their NTFPs, spurring an 11% increase in the market value. AFICC and FORESCOM, ACOFOP’s forest product brokers, estimated that the <i>bodega</i> increased income by 40% through improved prices, a reduction in the rate of product loss during processing (especially xate palm fronds), and by guaranteeing AFICC’s participation in the breadnut and allspice harvests. For example, AFICC did not participate in the allspice harvest during 2020-2021, but during 2022 AFICC sold Q.4,412 (£455) of allspice, benefitting 12 individuals from 10 families. With breadnut, AFICC’s sales increased from an average of £3,191 annually during 2020 and 2021, to £10,865 during 2022. Xate demonstrated the opposite trend due to market slowdowns during the COVID-19 pandemic. In 2020, AFICC reported £23,687 of xate income, in 2021 £9,516, and in 2022 production dropped to £5,449. We estimated that the <i>bodega</i> helped reduce xate loss by 10%, increased breadnut production by 44%, and was responsible for 100% of the allspice production to yield an overall rate of 21% of “net” impact.
Poultry Ranching	100%	The IWT076 project implemented the first poultry ranching investments in San Miguel; they did not occur previously. This led us to register all poultry ranching income as a direct result of the project.

Second, the ROI of livelihoods investments can be evaluated based only on “direct investments” (i.e., the resources provided directly to IPLC beneficiaries), or it can include additional “delivery” and “programmatic” costs. We undertook the analysis including all three categories of investment



to better comprehend the true costs of improving rural livelihoods and the return that can be expected from any one grant.

Third, most conservation and/or sustainable development funding sources seek proposals that include counterpart funding, as either formally pledged “match funding” that is audited, or as “leveraged funding” that is not formally audited but does help to ensure synergy between funding sources and expand the impact of any one project. We thus considered it important to include leveraged amounts when evaluating the return on investments, helping to ensure comprehension of the scale and scope of impact that can accrue from these types of investments. Guided by the considerations above, we calculated the income obtained by beneficiary households supported by each livelihood alternative, including the average amount of “gross” and “net” income captured per household.

**Table A1.2: Number of Beneficiary Households and Average “Gross” and “Net” Income/Household**

Livelihood	# Beneficiary Households	Average “Gross” Income/Household	Average “Net” Income/Household
Apiculture	48	£1,981.79	£495.45
Restoration/Agroforestry	68	£611.78	£611.78
NTFP Management	167	£346.17	£72.70
Poultry Ranching	11	£214.09	£214.09
All Livelihoods Total/Averages	231 <sup>1</sup>	£852.35	£465.17

<sup>1</sup> 231 different households participated in livelihoods activities; this total is less than the sum of the beneficiary households in participating in each livelihood since some households participated in 2 or more livelihoods.

Results revealed that the average “net” household income among all four economic alternatives was £465.17, or approximately Q.4,806. Restoration and/or agroforestry-related income provided the greatest average source of “net” income (£611.78), followed by apiculture (£495.45), poultry ranching (£214.09), and NTFP management (£72.70) respectively). We believe that these “net” income figures provide the best estimates of the true economic impact of the project, since they represent income directly attributable to the IWT076 project and leveraged sources. Regarding “gross” income, apiculture delivered the greatest benefits to IPLC households, followed by restoration/agroforestry, NTFP management, and poultry ranching, respectively. Undoubtedly, the pre-eminence of beekeeping was influenced by ~10 beekeepers with large-scale operations, perhaps indicating that some smaller honey producers have significant potential for growth.

## 2. Sustainability

We evaluated the sustainability of each IWT076 livelihoods investment considering the following factors, including (a) Short-term sustainability: the probability that each livelihood will be sustained at least 1 year beyond the end of the project; (b) Mid-term sustainability: the probability that each livelihood will be sustained at least 5 years beyond the end of the project; (c) Ecological sustainability: the degree to which ecological processes are likely to sustain the natural resources and/or ecological processes underlying the livelihood; (d) Climate vulnerability: the degree to which the vagaries of climate may negatively impact each livelihood, resulting in either a temporary suspension or total collapse of the livelihood; and (e) Normative sustainability: the degree to which the livelihood requires significant technical support, thereby increasing the

reliance of rural households and/or community-based cooperatives on external assistance. With this last criterion, we defined “high” as meaning that an industry was relatively free of bureaucratic procedures and permitting, or alternatively, that people would be able to continue production and generate income/benefits should they be unable to complete permitting and/or comply with other bureaucratic or technical procedures. Conversely, “very low” implies that the livelihood would be extremely unlikely to proceed without proper permitting or technical compliance. We assigned an average “sustainability score” for each livelihood among by weighting each factor equally and calculating the composite average value or “score” using the following scoring: High: 4 points; Medium: 3 points; Low: 2 points; and Very Low: 1 point.

We defined the evaluation criteria as follows:

- High (4): most positive scenario; high probability or likelihood 100%-75%
- Medium (3): positive scenario; medium probability or likelihood 74%-50%
- Low (2): neutral scenario; low probability or likelihood 49%-25%
- Very Low (1): negative scenario; very low probability or likelihood 24% - 0%

**Table A1.3: Qualitative and Quantitative Sustainability Criteria Evaluations for Sustainable Livelihoods implemented during IWT076**

Livelihood	Short-term Sustainability	Mid-term Sustainability	Ecological Sustainability	Climate Resilience	Normative Sustainability	
Apiculture	High	Medium	High	Low <sup>2</sup>	Medium <sup>4</sup>	
Restoration/Agroforestry	Medium <sup>5</sup>	Medium	High	Low <sup>2</sup>	Medium	
NTFP Management	High	Medium	High	Medium	Low <sup>3</sup>	
Poultry Ranching	Low <sup>1</sup>	Very Low <sup>1</sup>	High	Medium <sup>1</sup>	High	

Livelihood	Short-term Sustainability	Mid-term Sustainability	Ecological Sustainability	Climate Resilience	Normative Sustainability	Score
Apiculture	4	3	4	2	3	3.2
Restoration/Agroforestry	3	3	4	2	3	3.0
NTFP Management	4	3	4	3	2	3.2
Poultry Ranching	2	1	4	3	4	2.8

<sup>1</sup> Poultry ranching has a “low” probability of short-term sustainability and a “very low” probability of mid-term sustainability due to the observed failure of five (5) of the 11 household poultry projects during the 31-month IWT076.

<sup>2</sup> Apiculture and Restoration/Agroforestry may be highly impacted by droughts and associated fires, especially during El Niño events; based on the precautionary principle both thus rank “low” in climate resilience.

<sup>3</sup> NTFP harvesting is considered to have a “low” ranking for normative sustainability due to CONAP’s tight control over the NTFP industry, although we also note that community-based organizations within the MBR rarely have their NTFP operations suspended.

<sup>4</sup> Apiculture within the MBR Multiple Use Zone does require permitting by CONAP, but some local beekeepers are able to sustain their operations without permits, subsequently selling their products through informal markets, bartering for other products, or by consuming honey within their households.

<sup>5</sup> Restoration had short-term and mid-term sustainability rankings of “medium” due to potential challenges with sustaining funding.

Our initial rapid analysis revealed that three (3) of four (4) livelihoods options have a good probability (i.e., “medium” or “high”) of being sustained at least five (5) years. Apiculture and NTFP management registered composite scores of 3.2, slightly above “medium”, with restoration/agroforestry slightly lower (3.0) due to lower climate resilience. Despite having two criteria ranked “high”, the composite sustainability score for poultry ranching was reduced by a “low”/“very low” sustainability scores - indicating that in the future poultry projects should increase

interventions to avert disease outbreaks that can lead farms to collapse. Additional conclusions include: (a) all four (4) livelihoods options rank “high” in regard to their ecological sustainability; (b) we ranked apiculture and forest restoration/agroforestry as most vulnerable to climate-related impacts, highlighting the need to mitigate fire and drought; and (c) support for NTFP harvesting should always consider the ability to comply with technical requirements (management plans, harvest licenses, transportation and export licenses, etc.).

### 3. Gender Equity

The WCS Guatemala team analysed the results of livelihoods investments to compare the potential of each one to increase income and/or tangible benefits to women. We report below the number of communities, households, and women/men engaged in each livelihood project, as well as the female participation percentage juxtaposed against the previously detailed rates of economic return and the sustainability scores for each livelihood.

**Table A1.4: Number of Communities, Households, Men, Women, % Women, engaged in Sustainable Livelihoods Interventions supported by IWT076, and Comparative Return on Investment and Sustainability Score for each Livelihood**

Livelihood	Communities	Total Households	No. Men	No. Women	% Women	ROI <sup>1</sup>	Sustainability Score
Apiculture	5	48	40	14	25.9%	£1.99	3.2
Restoration/Agroforestry	4	68	78	29	27.1%	£4.10	3.0
NTFP Management	1	167	141	66	31.9%	£1.56	3.2
Poultry Ranching	1	11	0	11	100%	£0.58	2.8
Totals		231 <sup>2</sup>	208 <sup>3</sup>	110 <sup>3</sup>	34.6%	£2.35	

<sup>1</sup> For this analysis, we detail “net” Return on Investment Scenario (i), consisting of a moderately conservative rate of return to rural households for each Pound Sterling invested in sustainable livelihoods activities (See **Annex 2** for more details).

<sup>2</sup> 231 different households participated in livelihoods activities; this total is less than the sum of the number of beneficiary households in participating in each livelihood since some households participated in 2 or more livelihoods.

<sup>3</sup> 110/208 different women/men participated in livelihoods activities, respectively; these totals are less than the sum of those engaged in each livelihood since some individuals participated in two or more livelihoods.

During the project, 110 women and 208 men captured direct benefits of livelihoods investments in Guatemala, yielding an overall female participation rate of 34.6%. When viable we aimed for greater participation by women, finding that their participation in some activities was limited by their time availability (caring for children/elderly in the household), the type/location of each activity, and cultural mores. This led us to prioritize poultry ranching as a homestead-based livelihood, with all poultry ranching leaders being women (100%). After poultry ranching, NTFP management yielded the second highest female participation rate (31.9%), with forest restoration/agroforestry systems (27.1%) in third place, and apiculture in fourth place (25.9%).

Partners also identified questions for future research that remained beyond the scope of this initial analysis. For example, (1) Did women capture an equal proportion (i.e., 34.6%) of the total income to rural beneficiaries, or did female income capture differ compared to men? and (2) How did women and men differ, if at all, in their expenditures of income obtained?

### 4. Additional Benefits

In some cases, livelihoods projects yielded additional, secondary benefits that may be important to consider when planning future projects, depending on the local context. Of particular relevance

were livelihoods investments predicated on having access to State land and/or natural resources, thus requiring some type of formal State approval. Project partners concluded that helping rural communities ratify or even increase their legal rights or “[tenure](#)” was perhaps as important as increasing household incomes and wellbeing in the short-term, since rural communities without rights to land and/or natural resources lack a foundation for their long-term development. This in turn often increases their reliance on more ecologically damaging livelihoods, including working as day labourers with cattle ranchers, timber trafficking syndicates, or relying on other illegal sources of income.

One notable example consisted of the case of San Miguel la Palotada, a community of 140 residents located within the Maya Biosphere Reserve (MBR). In 2009, San Miguel was slated for eviction by CONAP, yet the years passed, and no eviction ever occurred; slowly but surely the community slid into extreme poverty, in large part due to their loss of access to land and natural resources. In 2021, CONAP wisely rescinded the eviction order against San Miguel, noting that the community had existed in its current location within the reserve nearly two (2) decades prior to the MBR’s creation. Although a great step forward, CONAP’s rescission of the eviction order left the community in limbo; while they no longer faced eviction, they still lacked a formal agreement with the State allowing them to inhabit their homes and manage land/natural resources around their community. Partners within the “*Juntos por San Miguel*” alliance subsequently initiated investments in apiculture, restoration/agroforestry, and poultry ranching, obtaining formal permission from CONAP to implement these activities with the community. The project built trust between the community and CONAP and yielded tangible results, including a low rate of IWT in the San Miguel area, reduced rates of deforestation, greater community engagement in fire prevention, and accelerated forest recovery across >100 hectares of degraded pasture lands. These results, in turn, increased CONAP’s interest in signing a formal agreement with San Miguel inhabitants, recognizing their rights to inhabit the area and to undertake livelihoods projects, including forest restoration, agroforestry, and apiculture, among other rights. Happily, the formal agreement or “*contrato*” was signed in July 2023, illustrating how sustainable livelihoods investments can help generate secondary benefits, in this case an increase in land and natural resource tenure for a community living within a national protected area.

Finally, as noted previously, 81.4% of beneficiary households recognized that livelihoods investments were driven by an interest in reducing the illegal wildlife trade, particularly illegal logging. This result was obtained by ensuring targeted and sustained outreach with beneficiary households, making this an additional or secondary benefit of the livelihoods investments, but one that was not a natural or logical result of the investments, rather one that required strategic planning and messaging by field technicians. We recommend that projects working on sustainable livelihoods alternatives to IWT evaluate the potential to link livelihoods investments explicitly to IWT goals, thereby helping to increase local awareness and social resilience to IWT over time.



**Table A1.5: Potential Secondary Benefits of Sustainable Livelihoods Options**

Livelihood	Potential Secondary Benefits
Apiculture	<ul style="list-style-type: none"> <li>• State recognition of community access to natural resources (on national lands)</li> <li>• Increased presence of ecologically important pollinators relevant to agriculture, agroforestry, and natural forest regeneration</li> <li>• Greater community awareness/action regarding uncontrolled forest fires</li> <li>• Increased food security from agricultural production</li> <li>• Greater social support from local communities for protected area management</li> </ul>
Restoration and/or Agroforestry	<ul style="list-style-type: none"> <li>• State recognition of community access to natural resources (on national lands)</li> <li>• Greater community awareness/action regarding uncontrolled forest fires</li> <li>• Opportunities to engage women in nursery management, tree planting, and land management</li> <li>• Increased food security from agricultural production (agroforestry systems)</li> <li>• Increased long-term economic potential via future timber harvests, if restoration/agroforestry systems increase abundance of timber species</li> <li>• Carbon capture, climate mitigation, and the potential for REDD+ income to national governments and/or rural communities</li> <li>• Improved habitat quality and quantity for diverse fauna</li> <li>• Greater social support from local communities for protected area management</li> </ul>
NTFP Management	<ul style="list-style-type: none"> <li>• State recognition of community access to natural resources (on national lands)</li> <li>• Greater community awareness/action regarding uncontrolled forest fires</li> <li>• Opportunities to engage women in NTFP harvesting, processing, and marketing</li> <li>• Greater social support from local communities for protected area management</li> </ul>
Poultry Ranching	<ul style="list-style-type: none"> <li>• Opportunities to engage women unable to dedicate time/travel to other sustainable livelihoods alternatives</li> <li>• Increased food security from agricultural production</li> <li>• Increased availability of “cheap” protein, with the potential to reduce impacts of hunting on wild game</li> </ul>



**Figure A1.1: Cruce a la Colorada farmers receiving forest restoration plots**

## 5. Conclusions

This rapid analysis of the impacts of sustainable livelihoods investments revealed the importance of considering the costs and benefits of each livelihood option from a holistic perspective. The four livelihood options supported during IWT076 delivered multiple benefits to rural households; however, they also varied considerably in terms of their economic impacts, with each livelihood option likely to face unique challenges over time.

**Table A1.6: Potential Challenges Facing Sustainable Livelihoods Options**

Livelihood	Potential Challenges
Apiculture	<ul style="list-style-type: none"> <li>• Drought and fire</li> <li>• Contamination by disease and/or herbicides or pesticides</li> <li>• Obtaining formal permits to harvest and commercialize honey, and associated dependence on external technical support</li> </ul>
Restoration and/or Agroforestry	<ul style="list-style-type: none"> <li>• Drought and fire</li> <li>• Sustained philanthropy to fund day wages for restoration</li> <li>• Timely and efficient implementation of International Climate Finance that delivers day wages to rural households and finances, at least in part, the costs of restoration</li> <li>• Obtaining formal permits/State recognition of community rights to restore forests and/or implement agroforestry systems</li> <li>• Sufficiently robust environmental governance frameworks and/or law enforcement to avoid leakage through continued expansion of ranching</li> </ul>
NTFP Management	<ul style="list-style-type: none"> <li>• Drought and fire</li> <li>• Obtaining formal permits to harvest and commercialize NTFPs, and associated dependence on external technical support</li> <li>• Modest economic impact, implying that NTFP management can contribute to rural household income but is unlikely to substitute other more robust and ecologically-damaging livelihood options</li> </ul>
Poultry Ranching	<ul style="list-style-type: none"> <li>• Disease management</li> <li>• Modest economic impact, implying that poultry ranching can contribute to rural household income but is unlikely to substitute other more robust and ecologically-damaging livelihood options</li> </ul>

It is important to note that for three livelihoods options – apiculture, restoration/agroforestry, and NTFP management – we categorized the normative aspects of permitting and/or obtaining formal State recognition as both “benefits” and “challenges”. This is because formal State recognition did indeed contribute to household security and/or help reinforce community tenure, but at the same time, obtaining State recognition was typically extremely cumbersome, requiring sustained patience and commitment. Delivery partners should thus consider their ability to sustain their technical support with communities over the mid-term, and ensure that communities are aware of the time potentially required to codify their rights to land and/or resources.

**“Gross” Return on Investment:** Scenario (c) detailed in Table 1, **Annex 2** details the combined ROI of all four livelihoods investments over a 31-month period. Under this scenario, rural households captured £196,892 of “gross” income propelled by £33,936 of DEFRA investment, a rate of return of £5.80 per each Pound Sterling invested by the UK. However, when analysing Scenario (f) that includes £166,437 of additional investments by leveraged sources, the ROI

dropped to £0.98. Both of these scenarios consider the full costs, including direct investments in rural households, delivery costs (i.e. delivery partner technical support), and programmatic costs (delivery partner leadership, office costs and overhead). It is important to note that for each Pound Sterling invested by the UK in sustainable livelihoods, WCS and implementing partners were able to leverage £4.90 of additional investment, significantly expanding the scale and scope of impact.

**“Net” Return on Investment:** Although the “gross” income figures helped demonstrate the scale of income generated by greener livelihoods options, we determined that “net” income was most appropriate for evaluating the true “return” on UK livelihoods investments. Net income, once again, consisted of the income directly resulting from IWT076 and leveraged investments, avoiding counting income that otherwise would have been captured absent the project. In this case, Scenario (i) revealed an average “net” ROI on DEFRA investments (alone) of £2.35 per Pound Sterling from all four livelihoods options combined. Investments in restoration/agroforestry provided the greatest “net” return (£4.10), followed by apiculture (£1.99), NTFP management (£1.56), and poultry ranching (£0.58), respectively. By contrast, Scenario (I) constituted by far the most conservative scenario for evaluating the efficiency of return on UK livelihoods investments since it included investments by both DEFRA and leveraged sources. In this case, the average “net” return on all four (4) livelihood options was £0.40 per Pound Sterling invested by the UK and all partners. In this case, NTFP management provided the leading ROI (£0.61), followed by restoration/agroforestry (£0.42), apiculture (£0.36), and poultry farming (£0.15), respectively.

Another key factor to consider when evaluating Return on Investment is the degree to which any community-based rural livelihood venture or business takes time to reach maturity and become profitable. Many community businesses such as Cruce a la Colorada’s NTFP Management, or family run enterprises such as Apiculture or Poultry Farming, only become profitable after several years of investment, or when demand is strong. At the same time, the bulk of this project’s economic activity occurred during the economic slowdown associated with the COVID-19 pandemic, certainly affecting NTFP demand and complicating technical support services by WCS and partner staff. Finally, it is important to recall that the ROI results discussed above and detailed in **Annex 2**, accrued during the 31-month project, yet all four (4) rural livelihoods initiatives continue operating in the field, generating income, and increasing the ROI over time.

The analyses detailed above provide a more nuanced understanding of the different costs and benefits generated by each livelihood option. However, we emphasize that economic return, in and of itself, is not the only criterion to consider when determining how to invest livelihoods funding wisely; additional criteria should be taken into account, including potential secondary benefits, normative viability, and local enthusiasm for any particular livelihood. At the same time, broad adoption of more ecologically sustainable rural livelihoods will likely depend on the degree to which these “green” livelihoods generate greater income for rural families when compared to traditional high-impact livelihoods, including cattle ranching.



Accordingly, we conclude by identifying two final questions for learning that could help ensure that sustainable livelihoods investments deliver the “triple-win” outcomes of biodiversity conservation, climate mitigation, and poverty reduction pursued by DEFRA and other donors:

- 1) How much annual income is required from “green” livelihoods to increase the likelihood that rural households will eschew other, less ecologically-friendly sources of income, particularly cattle ranching and timber trafficking?
- 2) If “green” livelihoods are not socioeconomically competitive with high impact livelihoods (i.e., cattle ranching) at the scope and scale required, can International Climate Finance (ICF) projects and carbon finance mechanisms play a role in making agroforestry and/or forest restoration economically attractive to rural households?



**Figure A1.1: Photograph of the former xate selection area in Cruce a la Colorada managed by AFICC, prior to the construction of AFICC’s NTFP bodega (R. B. McNab)**



## Annex 2: Returns on Investment (ROI) in Sustainable Livelihoods with Rural Households

Tables below provide figures for the “gross” and “net” Return on Investment (ROI), defined as income or benefits captured by rural households resulting from IWT076 investments. We define the ROI or “return” as the value in Pounds Sterling captured by rural beneficiaries for each Pound Sterling invested. We provide ROI for the investments undertaken only by DEFRA, and for all the investment provided by DEFRA and leveraged sources. Table 1 details results for all four livelihoods options supported by the project. Scenarios include:

**Scenarios a,b,c:** “Gross” income, investment, and ROI per Pound Sterling invested considering only IWT076 investments

**Scenarios d,e,f:** “Gross” income, investment, and ROI per Pound Sterling invested by both IWT076 and leveraged sources

**Scenarios g,h,i:** “Net” income, investment, and ROI per Pound Sterling invested considering only IWT076 investments

**Scenarios j,k,l:** “Net” income, investment and ROI per Pound Sterling invested by both IWT076 and leveraged sources

**Table A2.1: Income, Investment, and ROI for all four livelihoods options supported by IWT076**

			ALL LIVELIHOODS		
	Return to UK-IWT Funds		INCOME	INVESTMENT	RETURN
(+)	<b>a) gross income versus direct investment in livelihoods</b>	GROSS INCOME	£196,892	£20,328	£9.69
↑	b) gross income versus direct investment and delivery costs		£196,892	£31,458	£6.26
	c) gross income versus direct investment, delivery costs, and programmatic costs		£196,892	£33,936	£5.80
	<b>Return to BOTH UK-IWT &amp; Leveraged Funds</b>				
	d) gross income versus direct investment in livelihoods		£196,892	£94,407	£2.09
↓	e) gross income versus direct investment and delivery costs		£196,892	£176,834	£1.11
	f) gross income versus direct investment, delivery costs, and programmatic costs		£196,892	£200,373	£0.98
	<b>Return to UK-IWT Funds</b>	NET INCOME			
↑	g) net additional income versus direct investment in livelihoods		£79,878	£20,328	£3.93
	h) net additional income versus direct investment and delivery costs		£79,878	£31,458	£2.54
	i) net additional income versus direct investment, delivery costs, and programmatic costs		£79,878	£33,936	£2.35
	<b>Return to BOTH UK-IWT &amp; Leveraged Funds</b>				
↓	j) net additional income versus direct investment in livelihoods		£79,878	£94,407	£0.85
	k) net additional income versus direct investment and delivery costs		£79,878	£176,834	£0.45
(-)	<b>l) net additional income versus direct investment, delivery costs, and programmatic costs</b>		£79,878	£200,373	£0.40

Analysis of the “gross” and “net” ROI to rural households resulting from IWT076 investments in honey production supported by the project, including per pound “return” to funding provided (only) by DEFRA, and funding provided by DEFRA and leveraged sources.

**Table A2.2: Income, Investment, and ROI for Apiculture supported by IWT076**

		APICULTURE			
	Return to UK-IWT Funds	GROSS INCOME	INCOME	INVESTMENT	RETURN
(+)	a) gross income versus direct investment in livelihoods		£95,126	£3,798	£25.05
↑	b) gross income versus direct investment and delivery costs		£95,126	£11,311	£8.41
	c) gross income versus direct investment, delivery costs, and programmatic costs		£95,126	£11,970	£7.95
	Return to BOTH UK-IWT & Leveraged Funds				
	d) gross income versus direct investment in livelihoods		£95,126	£24,531	£3.88
	e) gross income versus direct investment and delivery costs	£95,126	£56,167	£1.69	
↓	f) gross income versus direct investment, delivery costs, and programmatic costs	£95,126	£66,225	£1.44	
	Return to UK-IWT Funds				
↑	g) net additional income versus direct investment in livelihoods	NET INCOME	£23,782	£3,798	£6.26
	h) net additional income versus direct investment and delivery costs		£23,782	£11,311	£2.10
	i) net additional income versus direct investment, delivery costs, and programmatic costs		£23,782	£11,970	£1.99
	Return to BOTH UK-IWT & Leveraged Funds				
	j) net additional income versus direct investment in livelihoods		£23,782	£24,531	£0.97
↓	k) net additional income versus direct investment and delivery costs		£23,782	£56,167	£0.42
(-)	l) net additional income versus direct investment, delivery costs, and programmatic costs		£23,782	£66,225	£0.36



Analysis of the “gross” and “net” ROI to rural households resulting from IWT076 investments in non-timber forest product management supported by the project, including per pound “return” to funding provided (only) by DEFRA, and funding provided by DEFRA and leveraged sources.

**Table A2.3: Income, Investment, and ROI for NTFP Management supported by IWT076**

		NTFP BODEGA		
		INCOME	INVESTMENT	RETURN
	Return to UK-IWT Funds			
(+)	a) gross income versus direct investment in livelihoods	£57,810	£6,071	£9.52
↑	b) gross income versus direct investment and delivery costs	£57,810	£7,140	£8.10
	c) gross income versus direct investment, delivery costs, and programmatic costs	£57,810	£7,767	£7.44
	Return to BOTH UK-IWT & Leveraged Funds			
	d) gross income versus direct investment in livelihoods	£57,810	£6,779	£8.53
	e) gross income versus direct investment and delivery costs	£57,810	£15,287	£3.78
↓	f) gross income versus direct investment, delivery costs, and programmatic costs	£57,810	£19,903	£2.90
	Return to UK-IWT Funds			
↑	g) net additional income versus direct investment in livelihoods	£12,140	£6,071	£2.00
	h) net additional income versus direct investment and delivery costs	£12,140	£7,140	£1.70
	i) net additional income versus direct investment, delivery costs, and programmatic costs	£12,140	£7,767	£1.56
	Return to BOTH UK-IWT & Leveraged Funds			
	j) net additional income versus direct investment in livelihoods	£12,140	£6,779	£1.79
↓	k) net additional income versus direct investment and delivery costs	£12,140	£15,287	£0.79
(-)	l) net additional income versus direct investment, delivery costs, and programmatic costs	£12,140	£19,903	£0.61

Analysis of the “gross” and “net” ROI to rural households resulting from IWT076 investments in agroforestry and/or forest restoration activities supported by the project, including per pound “return” to funding provided (only) by DEFRA, and funding provided by DEFRA and leveraged sources.

**Table A2.4: Income, Investment, and ROI for Restoration and/or Agroforestry supported by IWT076**

			RESTORATION		
Return to UK-IWT Funds			INCOME	INVESTMENT	RETURN
(+)	a) gross income versus direct investment in livelihoods	GROSS INCOME	£41,601	£7,732	£5.38
↑	b) gross income versus direct investment and delivery costs		£41,601	£9,500	£4.38
	c) gross income versus direct investment, delivery costs, and programmatic costs		£41,601	£10,137	£4.10
	Return to BOTH UK-IWT & Leveraged Funds				
	d) gross income versus direct investment in livelihoods		£41,601	£58,857	£0.71
	e) gross income versus direct investment and delivery costs		£41,601	£92,261	£0.45
↓	f) gross income versus direct investment, delivery costs, and programmatic costs	NET INCOME	£41,601	£98,962	£0.42
	Return to UK-IWT Funds				
↑	g) net additional income versus direct investment in livelihoods		£41,601	£7,732	£5.38
	h) net additional income versus direct investment and delivery costs		£41,601	£9,500	£4.38
	i) net additional income versus direct investment, delivery costs, and programmatic costs		£41,601	£10,137	£4.10
	Return to BOTH UK-IWT & Leveraged Funds				
	j) net additional income versus direct investment in livelihoods		£41,601	£58,857	£0.71
↓	k) net additional income versus direct investment and delivery costs		£41,601	£92,261	£0.45
(-)	l) net additional income versus direct investment, delivery costs, and programmatic costs		£41,601	£98,962	£0.42

Analysis of the “gross” and “net” ROI to rural households resulting from IWT076 investments in poultry ranching supported by the project, including per pound “return” to funding provided (only) by DEFRA, and funding provided by DEFRA and leveraged sources.

**Table A2.5: Income, Investment, and ROI for Poultry Ranching supported by IWT076**

		POULTRY RANCHING		
Return to UK-IWT Funds		INCOME	INVESTMENT	RETURN
(+)	a) gross income versus direct investment in livelihoods	£2,355	£2,728	£0.86
↑	b) gross income versus direct investment and delivery costs	£2,355	£3,507	£0.67
	c) gross income versus direct investment, delivery costs, and programmatic costs	£2,355	£4,062	£0.58
	<b>Return to BOTH UK-IWT &amp; Leveraged Funds</b>			
	d) gross income versus direct investment in livelihoods	£2,355	£4,239	£0.56
	e) gross income versus direct investment and delivery costs	£2,355	£13,119	£0.18
↓	f) gross income versus direct investment, delivery costs, and programmatic costs	£2,355	£15,282	£0.15
	<b>Return to UK-IWT Funds</b>			
↑	g) net additional income versus direct investment in livelihoods	£2,355	£2,728	£0.86
	h) net additional income versus direct investment and delivery costs	£2,355	£3,507	£0.67
	i) net additional income versus direct investment, delivery costs, and programmatic costs	£2,355	£4,062	£0.58
	<b>Return to BOTH UK-IWT &amp; Leveraged Funds</b>			
	j) net additional income versus direct investment in livelihoods	£2,355	£4,239	£0.56
	k) net additional income versus direct investment and delivery costs	£2,355	£13,119	£0.18
(-)	<b>l) net additional income versus direct investment, delivery costs, and programmatic costs</b>	£2,355	£15,282	£0.15