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| ***1. Project Title*** | Shady Solutions: Planting Trees, Growing Resilience |

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| ***2a. Primary Contact or Project Manager1*** |
| Name | Rhana Paris |
| Title | Outreach Coordinator |
| Organization Name | North Carolina Aquarium on Roanoke Island |
| Organization Tax ID Number | 400022 |
| E-mail address | Rhana.paris@ncaquariums.com |
| Mailing Address | PO Box 967 |
| City | Manteo | State | NC | Zip | 27954 |
| Telephone | 252-475-2344 | Fax Number 252-473-1980 |  |

**1****A paragraph or Statement of Qualifications must be provided in Section 4 of the application form to confirm that**

**anyone designing, installing, or monitoring the proposed project is qualified to do so.**

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| 2b. Execution Address (where contract will be mailed for signature) |
| Name  | Jay Barnes |
| Title | President |
| Organization Name | North Carolina Aquarium Society |
| E-mail Address  | Jay.barnes@ncaquariums.com |
| Mailing Address  | 3125 Poplarwood Court, Suite 160 |
| City  | Raleigh | State | NC |  Zip | 27604 |
| Telephone  | 919-877-5500 x224 | Fax Number  | 919-981-5224 |
| Federal Tax ID Number | 600989393 |

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| 2c. Payment Address (where invoice payments will be mailed) |
| Name  | Heather Flynt |
| Title | Controller |
| Organization Name | North Carolina Aquarium Society |
| E-mail Address  | Heather.flynt@ncaquariums.com |
| Mailing Address  | 3125 Poplarwood Court, Suite 160 |
| City  | Raleigh | State | NC | Zip | 27604 |
| Telephone  | 919-877-5500 x234 | Fax Number  | 252-473-1980 |

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| ***3. Project Description (provide a short summary of the project).***  |
| Trees provide all kinds of benefits: they exhale oxygen through photosynthesis, they create shade on a hot day and block the wind in winter, they control erosion which keeps our estuaries clean, they offer food and shelter to native animals, and, perhaps more pressing, they sequester rampant carbon dioxide in their leaves and tissues, helping us reduce our impact due to climate change. Trees are the unsung heroes in climate resilience! Many trees and forests in our area are under threat due to sea level rise, weather pattern changes, and development. We need more trees! Encouraging North Carolinians to plant more trees can help offset the loss of trees and forests in our area, maintain clean waterways, create climate resilience along our rivers and estuaries, and help offset our carbon footprint. The Shady Solutions Project will promote the planting of trees, particularly oak trees, as a climate change resilience strategy to three audiences in the Albemarle-Pamlico Watershed of Northeastern North Carolina (NE NC):1. 3rd grade students and teachers in surrounding counties

Third grade students and teachers will have opportunities to participate in three programs over the schoolyear. In the first year of the grant, schools from Dare County will participate—both teachers and principals from our five elementary schools have expressed interest in participating already. Third grade was selected as our target audience for this project as one of the state science standards for third grade relates to plants and soils (3.L.2). During the first program in the fall, a tree suitable to the school grounds will be planted—information on how to monitor the tree and activities appropriate to 3rd graders will be provided. Programs in winter and spring will continue the lesson in the importance of trees for water quality, soil health, and animal habitat. Climate change and solutions that provide resilience will also be major parts of the each of the three lessons. Based on the success of the first schoolyear’s programs, schools from surrounding counties will be encouraged to participate in a second year of tree plantings and lessons. For both Dare County and surrounding counties, if they can demonstrate that their trees are still alive, they can earn free virtual lessons.1. Patrons of summer library reading programs

Programs at NE NC area libraries will be offered in the summer of 2022. “An Ocean of Possibilities” is the theme and our interactive, family-focused program will demonstrate the relationship between our estuaries and our oceans as well as promote strategies for reducing our carbon footprint and supporting resilience by way of tree plantings. Participating libraries will have an opportunity to have an appropriate native tree planted on their grounds as an event in the fall. As an incentive, libraries who receive a tree and can demonstrate that their tree is still alive and well after 9 months will be entered into a raffle for a free membership to the Aquarium that they then raffle to a family in their region. 1. Participants at local public events like festivals and farmers’ markets

Aquarium educators and volunteers will staff demonstration booths at local festivals and farmers’ markets from November 2021 to May 2023. We plan to promote tree planting as a strategy for climate change resilience in addition to other solutions local communities can take to help maintain the health of our estuaries and oceans. Summer public events will have information on native trees for different locations to accommodate the mix of residents and visitors. Fall booths will also have trees available for planting since more residents tend to come to these events—as an incentive, participants who receive a tree and can demonstrate that their tree is alive and well after 9 months will be entered into a raffle for a free membership to the Aquarium. Evaluation of each of the three parts of the project during the first year will help us adjust each program for the second year of the grant. Surveys, pre and post quizzes, follow up emails and repeat participation will help us determine the strengths and challenges of reaching each of the three audiences. Photo entries showing planted trees are alive and well will also be used to gauge success.Both APNEP and the NC Aquarium on Roanoke Island will benefit from this grant. For APNEP, the proposed program will bring awareness about APNEP to different groups from around the Albemarle-Pamlico Estuary region: school children, their teachers and parents; library patrons across NE NC; and participants at festivals and events around NE NC. The proposed program would highlight native trees and their benefits to our local aquatic systems, particularly our estuaries. The NC Aquarium on Roanoke Island strives to reach a diverse audience when promoting an appreciation of and strategies for conserving our aquatic resources. While most of our Aquarium visitors are tourists from outside of the state, our educational programs, especially our Outreach programs, are geared toward North Carolina residents. Many of the counties in our area are designated as Tier 1 on the state’s socio-economic scale. Schools, libraries and event organizers in these counties are limited in funds to bring our Outreach programs to their students, patrons and event participants—this grant would allow us to reach different schools, libraries and regional events, many with underserved populations, and broaden the reach of our aquarium and its mission.  |
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| ***4. Statement of qualifications (provide a brief explanation of your organization’s qualifications to complete the project)*** |
|  If selected, this grant will be the third APNEP grant awarded to our Outreach Program. We have also applied for and received several other grants over the past 13 years: Dominion Educational Partnership, North Carolina GlaxoSmithKline Foundation, Dare Education Foundation, and the North Carolina Science Festival, totaling over $50,000 in funding. All have been used to expand our reach into the counties of NE North Carolina through outreach programs to schools, libraries and other events for NE NC residents. We have been able to evaluate and report on the successes and challenges faced in each grant. Rhana has been a non-formal educator in North Carolina for over 25 years. She has been the Outreach Coordinator at the North Carolina Aquarium on Roanoke Island for the past 13 years. She holds a BS in Biology, a MS in Environmental Science/Education and an MA in Science Education. She has worked extensively with school teachers and their students to present outreach and virtual lessons that meet state standards. She has presented programs at over 25 area libraries in NE and central NC. And she has presented demonstration and informational booths at various festivals and farmers’ markets around NE NC. |
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| ***5. Project Start Date*** | October 2021 | ***Project End Date*** | May 2023 |

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| **6. Project Location: Important to submit as completely as possible, especially the Lat/Long coordinates. Only projects which take place within or primarily impact areas in APNEP’s management boundary will be considered for funding.**  |
| Project Location | Counties within NE NC: Dare, Currituck, Tyrrell, Chowan, Pasquotank, Perquimans, Camden, Gates, Hertford, Bertie, Washington, Hyde, Beaufort, Martin |
| River Basin(s) | Pasquotank, Tar-Pamlico, Chowan, Lower Roanoke |
| Position coordinates of project location | Latitude 35.92               Longitude -75.70                |

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| **7. List which CCMP Actions will be addressed and how the proposed activity will address them:** |
| Link to [**APNEP Comprehensive Conservation and Management Plan**](https://apnep.nc.gov/resources/publications-and-reports/ccmp) **(CCMP)** **The CCMP actions that this grant would address are:****D2.2 –Third grade teachers would learn about trees and their ability to help improve water quality and reduce soil erosion as well as instruments of resilience to climate change. Handouts and materials they could use in subsequent years would be provided. Information on the CCMP would be part of the lessons as well.** **D2.3 – Library patrons and participants of public events like farmers’ markets and festivals would learn about the importance of trees to the health of our estuaries and the native animals who live there through the library programs and the booths set up at various events. Improved water quality would also be emphasized.**   |

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| **8. Brief explanation of linkage to APNEP priority areas (1)water quality, (2)submerged aquatic vegetation, (3)coastal habitats, (4)increasing resiliency:** |
| This project would focus on increasing community resiliency (4) within the study area by teaching the three groups of participants the importance of trees to combatting climate change and its effects on water level rise and the increased potential for flood events. Encouraging the planting of trees by the three groups would also tie in with promoting water quality (1) along our estuaries as trees help reduce water temperatures and hold soils. Lastly, increasing tree cover supports native animal species and improves coastal habitats (3)—participants would gain an understanding of the relationships between trees and our coastal habitats.  |

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| ***9. List activities that will be used to monitor or indicate the success of the proposed activity/project by listing one or more output and/or outcome metrics that will be measured, documented, and reported after project completion, as well as the expected target for each metric. Please also include a short explanation for how each listed metric assists in measurement of a CCMP Action being implemented by the project. Please see the proposal guidelines RFP*** [***output/outcome example document***](https://apnep.nc.gov/documents/engagement-outputsoutcomes-guidance) ***for details.***  |
| For the 3rd grade lessons:Output: * 45 presentations over the 2021-2022 schoolyear: three presentations to approximately 28 students and 1 teacher in each class with an average of three 3rd grade classes for the five elementary schools in Dare County the first year.
* 15 trees will be planted in Dare County.
* 36 presentations over the 2022-2023 schoolyear: three presentations to approximately 28 students and 1 teacher in each class with an average of three 3rd grade classes for four elementary schools in surrounding counties of the Albemarle-Pamlico Watershed the second year
* 12 trees will be planted at schools in other counties within the watershed.

Outcome:* Students would be given a pre and post program quiz to gauge changes in understanding of as well as attitudes toward trees, estuary health and climate change issues. An increase in their score from an average of 3 out of 5 correct answers to 4 out of 5 correct answers is expected. Questions will likely include name your watershed, list the benefit of trees, and more.
* Teachers would be given a paper evaluation to measure how well the lessons met their science standard needs. An average of 8 out of 10 points is expected.
* At least half of the trees would still be alive at the Dare County and surrounding county schools a year after planting—photos of each tree would be requested and posted on social media. Successful schools will be offered a virtual program.

For the library programs:Output:* 12 libraries from the APNEP watershed area would sign up for a summer reading program during the Summer of 2022.
* Estimated 750 patrons would attend in total and would represent the demographics of their county.
* Eight libraries would allow us to plant a tree at their or a nearby county facility in the Fall of 2022.
* Five trees would be given away at each of the eight libraries for a total of 40 trees at the fall events.

Outcome:* At least half of the patrons would sign a pledge sheet to help maintain the health of their trees and to plan to plant more trees at the end of each library program.
* A total of 240 patrons would come to the tree planting events held in the fall.
* At least half of the give-away trees would still be alive the summer of 2023 as evidenced by photos turned in to Aquarium social media. Successful libraries will be entered into a raffle for an Aquarium membership to be given to one of their patrons.

For the festivals and farmers’ market events:Output:* Eight events would be scheduled over the period of November 2021 to November 2022.
* Approximately 2400 event participants would attend in total.
* Fifteen trees total would be given away at events held in September, October or November.

Outcome:* At least 500 participants will sign a pledge to protect their trees or plant new trees as a way to help keep estuaries healthy and create climate change resilience.
* At least half of the trees given away would still be alive in the Spring of 2023 as evidenced by photos turned in to Aquarium social media. Successful participants will be entered into a raffle for an Aquarium membership.

All total, 109 presentations would inform 4,173 individual participants about climate change issues within our watershed by Spring 2023 and result in at least 90 trees planted by November 2022. It is estimated that those 90 trees, once fully grown, would:* process nearly 10 million gallons of water through transpiration,
* intercept over 68,000 gallons of rainwater, and
* pull over 4,320 pounds of rampant carbon dioxide out of the atmosphere every year.
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| 10. Description of funds (Combined APNEP and leveraged funds. |
| Description of Service | APNEP | Contract Applicant (Cash, In-Kind, Other)(e.g. In-kind - staff assistance 5hrs/wk\*$13/hr\*10wks=$650) | Other Contributions(Organization, Cash, In-Kind, Other)(e.g. NC DMF - In-kind – staff assistance 5hrs/wk\*$13/hr\*10wks=$650) | Total |
| Personnel/Salary | Intern at events $12/hr\*5hr each\*8 festivals=$480 | In-kind - outreach coordinator $19/hr\*458h=$8702 | NC Aquarium green award – Jennette’s Pier educator for Dare County programs -- $100\*15 programs=$4,500 | $13,682 |
| Fringe Benefits | NA | In-kind – outreach coordinator health/benefits $1/hr\*458=$458 | NA | $458 |
| Project Supplies  | Trees - $5/tree\*120 trees=$600  | In-kind – props for library programs=$100 | NA | $700 |
| Equipment  | NA | NA | NA | 0 |
| Transportation/Travel | Est travel costs to schools out-of-county - $100\*12\*3=$3600Ave travel costs to libraries out-of-county - $100\*12=$1200Ave travel costs to libraries for tree planting - $100\*8=$800Est travel costs to events out-of-county - $100\*4=$400(travel to programs in Dare=$0) | NA | NA | $6,000 |
| Sub-contract Services | NA | NA | NA | 0 |
| Other Direct Costs | Program fees for schools - $100/program\*81 programs\*=$8,100Program fees for libraries - $100/program\*12 libraries=$1,200Tree planting at 8 libraries - $100/program\*10 libraries=$800Program fees for public events - $250/booth\*8=$2,000 | NA | NA | $12,100 |
| Total Direct Cost | $19,180 | $9,260 | $4,500 |  |
| \*Indirect Cost (F&A) (not to exceed 10%)(e.g. 10% of the total direct costs $10,000 = $1,000) |  |  |  |  |
| Total Cost | $19,180 | $9,260 | $4,500 |  |

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| ***11. Describe leveraging of funds from project partners (Optional):*** |
| \*Check with Heather Jennings for more information at 919-707-8632NCA-RI and Jennette’s Pier have applied for Aquarium Division-wide funding for a tree planting program similar to what is proposed for the schools in this proposal. We have asked for $1,000 to help cover the cost of purchasing trees and equipment to help keep the trees alive during the summer. It is entitled the Kids Caring about the Climate – Tree Planting Community Project. This funding is listed in the Other Contributions column above.  |

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| 12. Project Partners (may add more if needed) |
| Agency Name |  |
| Agency Address |  |
| Role/contribution to Project |  |
| Contact Person |  | Phone No. |  |
| E-mail address |  |
| Agency Name |  |
| Agency Address |  |
| Role/contribution to Project |  |
| Contact Person |  | Phone No. |  |
| E-mail address |  |

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| ***13. Project Milestone Schedule*** |

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| **Time Period / Date** | **Activities (List specific outputs or activities that will be achieved during each quarter.)** |
| First Quarter/Fall 2021 | * purchase trees, equipment to maintain them
* present at one public event with trees
* teach first lesson with Dare County 3rd grade students
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| Second Quarter/Winter 2022 | * teach second lesson with Dare County 3rd grade students
* set up public events for 2022
* set up library program dates
 |
| Third Quarter/Spring 2022 | * teach third lesson with Dare County 3rd grade students
* select schools in surrounding counties for school lessons in next schoolyear
* present at one public event
 |
| Fourth Quarter/Summer 2022 | * present at the libraries
* present at three public events
 |
| Fifth Quarter/Fall 2022 | * teach first lesson to 3rd graders at selected schools
* plant trees at selected libraries
* present at three public events with trees
* purchase more trees, if needed
 |
| Sixth Quarter/Winter 2023 | * teach second lesson at selected schools
 |
| Seventh Quarter/Spring 2023 | * teach third lesson at selected schools
* determine health of planted trees: award virtual tours to successful schools, raffle memberships to successful libraries/individuals
* turn in notes/evaluations to APNEP
 |

**Note: All projects must submit a detailed Final Project Report that is due by the end of the contract for APNEP review and approval. Supplemental information should include (when relevant) a file containing data collected during the project, GIS Data, brochures, outreach tools, photographs or videos taken during the project, and a summary of survey results.**

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| ***14. References and Literature Cited (if applicable)*** |
| Hancock, Lorin. What is forest degradation and why is it bad for people and wildlife? [https://www.worldwildlife.org/stories/what-is-forest-degradation-and-why-is-it-bad-for-people-and-wildlife retrieved 15 July 2021](https://www.worldwildlife.org/stories/what-is-forest-degradation-and-why-is-it-bad-for-people-and-wildlife%20retrieved%2015%20July%202021). Harris, Nancy, Susan Cook-Patton, David Gibbs and Kristine Lister. Sept 23, 2020. Young forests capture carbon quicker than previously thought. World Resources Institute. [https://www.wri.org/insights/young-forests-capture-carbon-quicker-previously-thought retrieved 15 July 2021](https://www.wri.org/insights/young-forests-capture-carbon-quicker-previously-thought%20retrieved%2015%20July%202021)Six ways trees benefit all of us. Oct 9, 2020. <https://www.nature.org/en-us/what-we-do/our-priorities/build-healthy-cities/cities-stories/benefits-of-trees-forests/> retrieved 15 July 2021. |