



Better Bycatch Reduction Devices

Annual Report 2021 & 2022



Project Status

Award Title:

**Better Bycatch Reduction Devices for the Gulf of Mexico
Commercial Shrimp Trawl Fishery: Sea Grant's Role**

- NOAA Award Number: NA21OAR4170095 (LA) & NA21OAR4170096 (TX)
- Investigators: PI - Julie Lively (Louisiana) and PI- Laura Picariello (Texas)
- Project Dates: 1/1/2021 to 12/31/2023
- Reporting Dates: 1/1/2021 to 12/31/2022



Background

This project is a collaborative effort amongst Louisiana Sea Grant (LASG), Texas Sea Grant (TXSG), NOAA Restoration Center, and NOAA Fisheries to restore finfish populations injured by the Deepwater Horizon oil spill through development and certification of new BRDs for the shrimp industry throughout the Gulf of Mexico.

Finfish bycatch in shrimp trawls impact both shrimpers and the environment. It causes additional labor for shrimpers who must sort and remove unwanted catch, and it is an environmental concern as many of these finfish species are commercially, recreationally, and ecologically important.

This project aims to improve bycatch reduction by identifying and increasing use of more efficient bycatch reduction devices (BRDs) for the Gulf of Mexico shrimp trawl fishery. Successful BRD designs could be certified for use to provide Gulf shrimpers with additional BRD options.

This is one of 18 Open Ocean Trustee Implementation Group Final Restoration Plan 2 projects selected to restore natural resource injuries caused by the Deepwater Horizon oil spill. Based on public input, this is one of several projects designed to increase opportunities for the fishing industry to engage in restoration efforts. For more information, please visit www.gulfspillrestoration.noaa.gov/restoration-areas/open-ocean.

NOAA Restoration's Monitoring and Adaptive Management (MAM) plan objectives:

Objective 1: Identify new advances in BRD system technology via regional surveys and domestic and international outreach

Objective 2: Evaluate bycatch reduction capabilities of new BRDs and certify BRDs that would provide a restoration benefit via bycatch reduction

Objective 3: Increase use of new BRD systems in the U.S. Gulf of Mexico shrimp fishery via outreach and incentives

Objective 4: Evaluate bycatch reduction of the new BRDs in the commercial shrimp fishery

Objective 5: Increase bycatch reduction by ensuring new BRD systems are used according to operational recommendations via outreach.

This document highlights Years 1 and 2 (Jan. 1, 2021 – Dec. 31, 2022) of progress by LASG and TXSG on the activities and deliverables accomplished as part of the Better Bycatch Reduction Device Project. Much of Year 1 and 2 activities have focused on the foundations for activity support in context of the MAM plan objectives. Many events and activities crossed multiple tasks and are charted for further reference.

Sea Grant Primary Program Components

Component 1: Communications and Outreach

Component 2: Research and Development

Component 3: New BRD Rollout

Component 4: Vessel Support

Component 5: Monitoring

Key Accomplishments

- Established Communications Team (2021) updated (2022)
- Created Communications Plan (2021) updated (2022)
- Created public communications products in English, Spanish, and Vietnamese (2021-2022)
- Developed and launched an industry survey on BRD use and knowledge in English, Spanish, and Vietnamese (2022)
- Secured Exempted Fishing Permit (EFP) for candidate BRD testing in commercial vessels (2022)
- Conducted joint BRD hunt (document current BRD use in Gulf, ID new gear) with NOAA (2021-2022)
- Collaborated with NOAA to maintain a database of BRD hunt results (2021-2022)
- Identified new BRD gear (from Gulf shrimpers, national, international (Australia)) (2021-2022)
- Created and updated a Stakeholder Working Group (SWG) for this project (2021-2022)
- Met with Stakeholder Working Group three times for feedback and input on project activities (2021-2022)
- Secured a subrecipient to support vessel contracting for BRD testing (2022)
- Developed pilot testing incentive levels based on industry economic considerations (2022)
- Participated in new BRD dive testing with NOAA (2022)
- Assisted NOAA with new BRD proof of concept testing (2022)
- Redesigned and updated existing BRD Gear Installation Guides for current certified gear (2022)

Project Adaptations

Multiple events resulted in adaptations to the project and the project timeline. These include the COVID pandemic; major hurricanes - Laura (August 2020; SW Louisiana) Delta (August 2020; SW Louisiana), Ida (2021; SE Louisiana), and Ian (2022; SW Florida) affecting infrastructure and supply chains; and economics of the shrimp industry including rising gas prices and declining shrimp prices. Identifying the need to recharacterize the active federally permitted shrimp fleet led to the modification of project targets to better reflect industry engagement.

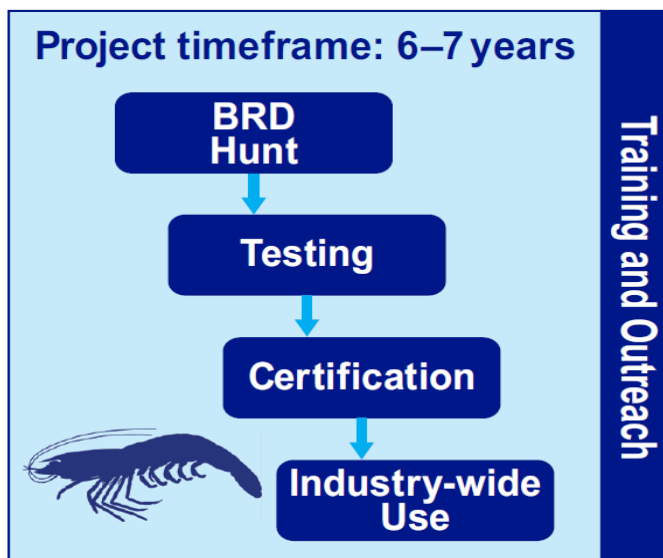
Project Personnel

To fulfill the large scope of the Better BRD project, project personnel were added to fill roles defined in the Sea Grant scope of work. This includes hiring two full-time project managers during Year 1, Tiffany Pasco (LASG) and Matthew Kammann (TXSG), as well as a research associate (Merritt McCall - LASG) and a graduate student (Sara Stewart - TXSG) during Year 2 to support testing efforts. Project roles are listed below, including hiring dates of those brought onto the project.

| Sea Grant Personnel | State | Work locale | Primary responsibility BBRD | NOTES |
|-------------------------|-------|-----------------------------------|------------------------------|------------------|
| Julie Lively | LA | Louisiana Sea Grant - Baton Rouge | Principal Investigator | |
| Laura Picariello | TX | Texas Sea Grant - Galveston | Principal Investigator | |
| Tiffany Pasco | LA | Louisiana Sea Grant - Baton Rouge | Program Manager | Hired July 2021 |
| Matthew Kammann | TX | Texas Sea Grant - Corpus Christi | Program Manager | Hired June 2021 |
| Merritt McCall (Walker) | LA | LSU - Baton Rouge | Research Associate - Science | Hired March 2022 |
| Sara Stewart | TX | Texas A&M - College Station | Graduate Student - Science | Hired June 2022 |
| Julie Falgout | LA | Louisiana Sea Grant - Houma | Industry Liaison | |
| Corley-Ann Parker | TX | Texas Sea Grant | Communications | |
| Roy Kron | LA | Louisiana Sea Grant - Baton Rouge | Communications | |
| Robert Ray | LA | Louisiana Sea Grant - Baton Rouge | Communications | |
| Thu Bui | LA | Louisiana Sea Grant - Abbeville | Agent | |
| Mark Shirley | LA | Louisiana Sea Grant - Abbeville | Agent | |
| Gary Graham | TX | Texas Fishery Liaison | Industry Liaison | Contracted 2022 |
| Rex Caffey | LA | Louisiana Sea Grant - Baton Rouge | Economics | |
| Steve Midway | LA | LSU-Baton Rouge | Science | |
| Tony Reisinger | TX | Texas Sea Grant - Port Isabel | Agent | |

Project Overview

- **TRAINING AND OUTREACH**
Provide support and materials on existing and new BRDs in the federal fleet
- **PHASE 1: BRD HUNT**
Identify new advances in BRDs
- **PHASE 2: TESTING**
Test bycatch reduction and shrimp retention of new BRDs through research pilot testing
- **PHASE 3: CERTIFICATION**
Certify successful new BRDs for use in the Gulf shrimp industry
- **PHASE 4: INDUSTRY-WIDE USE**
Increase voluntary use of new BRDs via outreach and incentives



PROGRESS

This section documents progress towards meeting three of the five primary program components (1) communications and outreach, (2) research and development, and (4) vessel support. This report is part of (5) monitoring, and the project has not yet reached (3) new BRD rollout.

COMPONENT 1: COMMUNICATIONS & OUTREACH

The implementation of Better BRD requires training and outreach on all levels (project team and industry) across all stages of the project (MAM objectives 1-5).

Outreach and Communications

To aid with the organization and messaging of Better BRD, a Communications and Outreach Committee was formed with members from partner agencies (LASG, TXSG, and NOAA) in Year 1. This committee drafted, passed, and continues to update a communications plan (Year 1, ongoing) with guidance on engagement strategies and timing for stakeholder groups within the federal shrimp industry, resource managers, and outside interest groups. A working list of stakeholders (ongoing) was also created and continues to be updated as the project develops. A website was created through LASG as part of this plan to inform all interested parties on Better BRD goals, major project updates, and host public outreach materials (Year 1, ongoing).

Key Activities-Outreach and Communications

2021 – Joint communications committee with all partner agencies formed and will continue to meet regularly throughout the project. Additional Sea Grant personnel recruited as needed to aid with design and implementation – completed

2021 – Communications plan version 1.0 finalized. The plan is a living document with ongoing updates – completed

2021 – Created a stakeholder list identifying participants in the Gulf of Mexico shrimp industry which is also a living document and continues to be updated as the project develops. – completed

2021 – Created the project website (www.laseagrant.org/outreach/projects/better-brds/) with the About page – completed

2021 – Created project brand guide – completed

2021 – Industry Factsheet, Info Card and Contact Card created and translated into Vietnamese and Spanish – completed

2022 – Presentation to shrimp industry at multiple meetings: Port Arthur Area Shrimpers Association, Southern Shrimp Alliance, Louisiana Shrimp Task Force – completed

2022 – Communications plan version 2.0 finalized. Updates include additional details on primary audiences to aid with communications – completed

2022 – Project website update with information on Industry testing page – completed

2022 – Project website update with Test Gear page – completed

Table 1: Public-facing documents associated with Better BRD Project Years 1 and 2. Documents listed can be found on the project website (www.laseagrant.org/outreach/projects/better-brds/brd-resources/).

| Outreach Documents | | | |
|--|-------------|-------------|-------------|
| Description | English | Spanish | Vietnamese |
| Industry Overview | X | X | X |
| Project Info Card | X | X | X |
| Project Team Contact Card | X | | |
| Industry Survey (BRD knowledge) | X | X | X |
| Current BRD Construction and Installation Guide – Fisheye | X | X | X |
| Current BRD Construction and Installation Guide – Composite Panel with Square Mesh Panel | X | X | X |
| Current BRD Construction and Installation Guide – Composite Panel with Cone | X | In progress | In progress |
| Current BRD Construction and Installation Guide – Jones-Davis | X | In progress | In progress |
| Current BRD Construction and Installation Guide – Modified Jones-Davis | In progress | | |
| BRD Project Website | X | | |
| BRD Hunt Testing Gear | X | | |
| Fisheye Quick Guide | In progress | | |

Trainings and Dockside Outreach

Part of ensuring the success of Better BRD is training not only the project team, but also agents from Sea Grant, state and federal agencies, and shrimpers (MAM 1). Efforts in Year 1 were delayed or postponed due to COVID-19 pandemic restrictions, which varied with each state and agency. However, an initial project team training event was able to occur (July 2021), and virtual resources were made available internally. Additional training with new personnel has occurred in Years 1 and 2, and a few Texas state agency trainings have been held. Sea Grant was able to facilitate dockside gear characterization and training events and had some opportunistic vessel gear evaluations while traveling in Years 1 and 2 (see also BRD Hunt). These efforts will continue throughout the grant.

At the request of shrimpers, Sea Grant is updating the construction and installation manuals for all current BRDs and translating the materials into Spanish and Vietnamese (Years 1-2). It was requested to make a “Quick Guide” to help shrimpers and project agents check frequently used BRDs as a fact-sheet and video (ongoing).

Outreach and training goals are defined to reach 20 percent of the federally permitted shrimp fleet in the Gulf of Mexico. Suggestions were made during Year 1 to modify the language of the MAM to reflect ACTIVE federal shrimp permit holders as there are known vessels who hold licenses but do not use them. Recent hurricanes (2020-2022) and other economic factors have shrunk the active numbers; thus this is a continuously updated estimation based on best information from Sea Grant agents and NOAA data.

Table 2: 2021 (Year 1) Sea Grant or Sea Grant and NOAA Better BRD Outreach efforts.

| Event | Date | Total Attendees (#) |
|---|------------|---------------------|
| Palacios, TX Dockside boat Check 1 | 2/27/2021 | 9 |
| Sabine Pass, TX Dockside boat Check 1 | 6/24/2021 | 9 |
| Port Arthur, TX Dockside boat Check 1 | 6/24/2021 | 6 |
| 2021 June Port Arthur Area Shrimpers Association Meeting (TX) | 6/30/2021 | 21 |
| NOAA-Sea Grant BRD training-in-person, Port Arthur, TX | 7/1/2021 | 20 |
| Palacios, TX Dockside boat Check 2 | 7/5/2021 | 6 |
| Palacios, TX Dockside boat Check 3 | 7/6/2021 | 9 |
| 2021 – TX Dockside Pre-season Outreach – Day 1 Port Isabel | 7/12/2021 | 21 |
| 2021 – TX Dockside Pre-season Outreach – Day 2 Port Arthur | 7/13/2021 | 12 |
| 2021 – TX Dockside Pre-season Outreach – Day 2 Port Isabel | 7/13/2021 | 9 |
| 2021 – TX Dockside Pre-season Outreach – Day 3 Brownsville | 7/14/2021 | 15 |
| 2021 – TX Dockside Pre-season Outreach – Day 3 Port Isabel | 7/14/2021 | 10 |
| 2021 – TX Dockside Pre-season Outreach – Day 4 Brownsville | 7/15/2021 | 12 |
| 2021 Fall Outreach, Bait Shop Rockport, TX | 10/6/2021 | 3 |
| 2021 Fall Outreach, Net Shop Palacios, TX | 10/11/2021 | 8 |
| Stakeholder Working Group – Meeting 1 | 11/4/2021 | 24 |
| 2021 Florida Dockside Outreach – Tampa | 12/6/2021 | 3 |
| 2021 Florida Dockside Outreach – Ft. Myers | 12/9/2021 | 24 |

Table 3: 2022 (Year 2) Sea Grant or Sea Grant and NOAA Better BRD Outreach efforts

| Event | Date | Total Attendees (#) |
|--|------------|---------------------|
| 2022 Texas BRD Hunt Galveston | 2/15/2022 | 60 |
| 2022 Texas BRD Hunt Port Arthur | 2/17/2022 | 48 |
| 2022 Texas BRD Hunt Bay City | 2/20/2022 | 117 |
| 2022 Louisiana BRD Hunt Intracoastal | 3/15/2022 | 45 |
| 2022 Louisiana BRD Hunt Venice | 3/22/2022 | 2 |
| 2022 Florida BRD Hunt – Tampa | 3/30/2022 | 12 |
| Stakeholder Working Group – Meeting 2 | 4/7/2022 | 23 |
| 2022 Louisiana BRD Hunt – Dulac/Chauvin/Fourchon | 4/26/2022 | 30 |
| 2022 TX Dockside Outreach – Port Isabel | 6/27/2022 | 21 |
| 2022 TX Dockside Outreach – Brownsville | 6/28/2022 | 21 |
| 2022 TX Dockside Outreach – Palacios | 6/29/2022 | 12 |
| 2022 TX Dockside Outreach – Palacios Day 2 | 6/30/2022 | 18 |
| 2022 TX Dockside Outreach – Pleasure Island | 7/6/2022 | 3 |
| 2022 TX Dockside Outreach – Sabine Pass | 7/7/2022 | 18 |
| 2022 TX Dockside Outreach – Galveston | 7/8/2022 | 3 |
| 2022 TX Dockside Outreach – Palacios Day 3 | 7/11/2022 | 18 |
| Stakeholder Working Group Meeting 3 | 10/27/2022 | 22 |
| Louisiana Shrimp Taskforce Meeting | 11/2/2022 | 20 |
| Southern Shrimp Alliance Board Meeting | 12/3/2022 | 15 |
| 203rd Louisiana Sea Grant Marine Extension Program Mtg | 12/13/2022 | 30 |

Key Activities: Trainings and Dockside Outreach

2021 – First project team and Sea Grant agents BRD training, led by NOAA (July – Port Arthur, TX) – completed

2021 – Texas dockside outreach effort – completed

2021 – Florida dockside outreach effort – completed

2022 – Created Dockside Outreach team (NOAA, LASG, TXSG) to coordinate all dockside outreach and gear evaluations – completed

2022 – Texas dockside outreach – completed

2022 – Louisiana dockside outreach – completed

2022 – Florida dockside outreach – completed

2022 – Dockside Outreach team identified target audience for 2023 outreach efforts-completed

Stakeholder Working Group

A Stakeholder Working Group (SWG) was formed to provide a resource of industry knowledge, and its formation is designed to give feedback to Sea Grant and NOAA on gear designs, project activities, industry thoughts, and outreach potential through the life of the Better BRD project. The group consists of shrimp industry members from across the Gulf of Mexico who represent each of the five states, both federal and state fisheries, the primary Gulf shrimp species (pink, white, and brown), and netmakers. The current group has suggested candidate BRDs, additional data parameters, and recommended important (for industry) criteria about candidate BRDs. Regular meetings with project updates occurred since group formation in Year 1, and the group remains active. This group will remain through the testing phase at which time its necessity will be reevaluated. (MAM objectives 1-5).

Key Activities: Stakeholder Working Group

2021 – Created a Stakeholder Working Group Plan defining the group purpose, membership, and estimated meeting schedule- completed

2021 – Formation of SWG with hurricane impact limitations – completed

2021 – Initial SWG Meeting 1 (Galveston, TX) – Introduced project and project team members to SWG. Introduced international tech industry research trials – completed

2022 – Full membership of SWG – completed

2022 – SWG Meeting 2 (Baton Rouge, LA) Highlighted the current project status and next steps (NOAA testing) for summer 2022 and hands-on test gear demonstrations – completed

2022 – SWG Meeting 3 (Baton Rouge, LA) – Results from NOAA testing were presented. SWG presented their opinions on where gear may be optimized – completed

COMPONENT 2: RESEARCH AND DEVELOPMENT

BRD Hunt

Better BRD is designed to identify new and novel technologies already in use in the Gulf of Mexico federal shrimp fleet, nationally and internationally. Using knowledge gleaned from BRD training and previous experiences, Sea Grant and NOAA developed an updated BRD characterization datasheet (Year 1) to record BRD technologies observed during routine gear evaluations and dockside outreach. A database was created from that datasheet with a data manager from each agency (NOAA, LASG and TXSG) responsible for entry and QA/QC.

The BRD Hunt occurred during Years 1 and 2 during regular Sea Grant courtesy dockside events (see Outreach table) and opportunistic outreach across the Gulf of Mexico as time/effort allowed (Year 2). Several novel BRD configurations were identified from this effort (various large mesh use designs, flapless TEDs, and combinations). Some industry modifications were identified for further testing and configuration in the project. Many nets inspected contained more than the federally required one bycatch reduction device. Texas and Louisiana had between 40 and 50 percent of inspected nets with multiple bycatch reduction modifications.

Concurrently, industry members were surveyed electronically on their knowledge of current BRDs, their use, and details that would increase willingness to accept new designs (“Want equal or more shrimp”, “get rid of sharks”).

Key Activities: BRD Hunt

2021 – Dockside inspections as able (pandemic/hurricanes) (see Outreach table) – completed

2021 – New BRD inspection datasheet – completed

2021 – New BRD database design in use, data managers identified and trained – completed

2022 – Dockside BRD Hunt push across Gulf of Mexico by Sea Grant and NOAA (see Outreach table) – completed

2022 – Created “New gear summary chart” to track identified new and novel BRDs from the Gulf of Mexico, national, and international hunt efforts. – ongoing

2022 – Implemented an electronic survey of current BRD knowledge and use – ongoing

2022 – Initial BRD hunt results presented to SWG (SWG Mtg 3, Outreach Table) – completed

Table 4: Total 2021 and 2022 (Year 1 and Year 2) BRD Hunt results from Sea Grant and joint Sea Grant and NOAA efforts. Shown is the total number of boats by state for each group effort.

| Total # Vessels Inspected during BRD Hunt | | | |
|---|------------|------------|-------------|
| Sea Grant | 2021 Total | 2022 Total | Grand Total |
| Florida | 26 | 15 | 41 |
| Louisiana | | 30 | 30 |
| Texas | | 35 | 35 |
| SG and NOAA | 2021 Total | 2022 Total | Grand Total |
| Florida | 1 | | 1 |
| Louisiana | | 48 | 48 |
| Texas | | 73 | 73 |

Table 5: Total 2021 and 2022 (Year 1 and Year 2) BRD Hunt results from Sea Grant and joint Sea Grant and NOAA efforts. Shown is the total number of nets by state for each group effort.

| Total # Nets Inspected During BRD Hunt | | | |
|--|------------|------------|-------------|
| Sea Grant | 2021 Total | 2022 Total | Grand Total |
| Florida | 104 | 3 | 107 |
| Louisiana | | 47 | 47 |
| Texas | | 61 | 61 |
| SG and NOAA | 2021 Total | 2022 Total | Grand Total |
| Florida | 4 | | 4 |
| Louisiana | | 62 | 62 |
| Texas | | 109 | 109 |

Testing

Two sets of evaluations of candidate BRDs will identify gear to move to the certification stage: NOAA- Testing and Sea Grant-led Industry Trials.

NOAA Dive and Proof of Concept testing allowed the team to examine how the gear functions on a mechanical and hydrodynamic level (Panama City dive testing) as well as an efficiency and catch composition level (trawls off Mississippi) to aid in initial use-recommendations and gather potential restoration characteristics. Industry trials will help provide detailed information on gear use under commercial fishing conditions including catch composition and preference of use by the industry.

During Panama City dive trials and later R/V Caretta proof of concept trials (Year 2), Sea Grant project team members were able to collect observations and media to aid later communications and outreach. Additionally, Sea Grant researchers assisted with data collection onboard, input the data, and sent it to NOAA (Year 2). SWG members were invited to participate, but testing was cut short due to pandemic and weather considerations.

Sea Grant-led Industry Trials are incentivized gear trials on commercial vessels with two parts or phases: pilot testing and BRD vs BRD. An exempted fishing permit (EFP) was applied for and received by TXSG to cover industry testing activities (Year 2). A Sea Grant science working group was formed of Sea Grant project team members and university researchers to draft data collection methods and protocols for industry testing. These efforts are ongoing and will be adjusted as industry testing moves forward.

To inform economic incentives, we used existing economics data regarding the shrimp industry to create a tool. Currently, this tool has been used for vessel participation at the pilot level (Year 2). This will also inform future pieces of the project.

Key Activities: Testing

2022 – Established Sea Grant science working group to provide input on Sea Grant-led industry testing – completed

2022 – Identified recruitment plans for industry testing – completed

2022 – Developed pilot testing datasheets with input from the Stakeholder Working Group and NOAA on qualitative data – completed

2022 – Gulf of Mexico Fisheries Management Council and NOAA approve an Exempted Fishing Permit for Texas Sea Grant covering industry testing activities thru December 2024 – completed

2022 – NOAA-led Proof of Concept: Dive Testing. The Sea Grant project team observed and documented testing – completed

2022 – NOAA-led Proof of Concept: Trawl Testing. Sea Grant researchers assisted with data collection during gear testing tows on R/V Caretta off the coast of Mississippi and documented testing – completed

2022 – Created economic tool for informing Pilot testing efforts – completed

COMPONENT 4: VESSEL SUPPORT

For vessel support and participant services, Sea Grant engaged Lynker after an open subaward call as the programmatic entity responsible for contracting with industry (Year 2). Lynker drafted an application and contract based upon Better BRD project team and SWG suggestions and met regularly for feedback regarding those documents. A process chart was drafted to track applicants throughout the testing engagement.

Key Activities: Vessel Support

2022 – Louisiana Sea Grant engaged Lynker through an open subaward call as the programmatic entity responsible for applications, contracting, and data verification during stakeholder testing – completed

2022 – Created Pilot Testing application (digital and paper) – completed

2022 – Drafted pilot stakeholder testing plan for workflow between Lynker, Sea Grant, and NOAA to track testing status – on-going

2022 – Created contract deliverables for industry to receive incentives for pilot testing – completed

2022 – Designed testing packet for participants with relevant information on BRD testing – completed