**WORKSHEET 4.** BIOLOGICAL CHANGE ASSESSMENT

GDE Unit ID

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| **Biological Response Type** | **Yes** | **No** | **Insufficient Data** |
| **Terrestrial Vegetation** |
| Growth & Productivity | Are there visible signs (i.e., less canopy cover) of reduced growth in native vegetation over time? |  |  |  |
| Growth & Productivity | Are NDVI or NDWI levels in terrestrial wildlife habitat areas progressively becoming lower over time? |  |  |  |
| Growth & Productivity | Is there a decrease in species listed as a sensitive, threatened, or endangered species associated with the GDE? Is there a measurable and persistent decline in vegetation cover or leaf area index? |  |  |  |
| Reproduction & Recruitment | Is the terrestrial wildlife habitat mostly composed of old mature trees with few seedlings and saplings present to take their place? |  |  |  |
| Reproduction & Recruitment | Is there a decrease in the populations of perennial resident species compared to baseline conditions? |  |  |  |
| Reproduction & Recruitment | Is there a reduction in the understory vegetation? |  |  |  |
| Mortality | During the last drought, did large proportions of terrestrial vegetation die or appear to decrease? |  |  |  |
| Mortality | Has there been loss of a species endemic to the area or listed as a sensitive, threatened, or endangered species associated with the GDE? |  |  |  |
| Ecosystem Structure & Function | Is there a growing trend of non-native species becoming present? Are there observable trends in the vegetation community toward more xeric (dry) vegetation? |  |  |  |
| Ecosystem Structure & Function | Do NDVI or NDWI maps show terrestrial wildlife habitat areas recovering in the wet years that follow a drought/dry period? |  |  |  |
| Ecosystem Structure & Function | Are groundwater levels more than 3–6 feet below the average rooting depth? |  |  |  |
| **River/Stream/Estuary** |
| Growth & Productivity | Are there visible signs (i.e., less canopy cover) of reduced growth in native riparian vegetation over time? |  |  |  |
| Growth & Productivity | Are flow-related migration impediments or barriers increased in number and/or severity compared to baseline conditions? |  |  |  |
| Growth & Productivity | Is there a decrease in endemic species or species listed as a sensitive, threatened, or endangered species associated with the GDE? |  |  |  |



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| **Biological Response Type** | **Yes** | **No** | **Insufficient Data** |
| **River/Stream/Estuary** |
| Reproduction & Recruitment | Is the riparian habitat mostly composed of old mature trees with few seedlings and saplings present to take their place? |  |  |  |
| Reproduction & Recruitment | Is there a decrease in the fish or amphibian rearing habitat for the GDE compared to baseline conditions? |  |  |  |
| Reproduction & Recruitment | Is there a decrease in the population of certain animal classes (e.g., fish, amphibians, reptiles, mammals, birds, anthropods) compared to baseline conditions? |  |  |  |
| Reproduction & Recruitment | Is there a decrease in the populations of perennial resident species compared to baseline conditions? |  |  |  |
| Reproduction & Recruitment | Is there a decrease in the population of species seeking refuge during dry or drought periods compared to baseline conditions? |  |  |  |
| Mortality | During the last drought, did large proportions of vegetation die or appear to decrease? |  |  |  |
| Mortality | Has there been loss of a endemic species or species listed asa sensitive, threatened, or endangered species associated with the GDE? |  |  |  |
| Ecosystem Structure & Function | Is there a growing density of non-native species? |  |  |  |
| Ecosystem Structure & Function | Do NDVI or NDWI maps show a difference in terrestrial wildlife habitat areas in wet years and drought/dry periods? |  |  |  |
| Ecosystem Structure & Function | Are portions of a stream that were once gaining groundwater now losing or disconnected systems? |  |  |  |
| Ecosystem Structure & Function | Are portions of a stream that were once losing groundwater now disconnected systems? |  |  |  |
| Ecosystem Structure & Function | Are groundwater levels more than 3–6 feet below the average rooting depth? |  |  |  |
| **Wetland/Seep/Spring** |
| Growth & Productivity | Are there visible signs (i.e., less canopy cover) of reduced growth in native vegetation over time? |  |  |  |
| Growth & Productivity | Is there a decrease in the population of endemic species or species listed as a sensitive, threatened, or endangered species associated with the GDE? |  |  |  |



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| **Biological Response Type** | **Yes** | **No** | **Insufficient Data** |
| **Wetland/Seep/Spring** |
| Reproduction & Recruitment | Is there a decrease in spawning habitat compared to baseline conditions? |  |  |  |
| Reproduction & Recruitment | Is there a decrease in the fish or amphibian rearing habitat for the GDE compared to baseline conditions? |  |  |  |
| Reproduction & Recruitment | Is there a decrease in the population of certain animal classes (e.g., fish, amphibians, reptiles, mammals, birds, anthropods) compared to baseline conditions? |  |  |  |
| Reproduction & Recruitment | Is there a decrease in the populations of perennial resident species compared to baseline conditions? |  |  |  |
| Reproduction & Recruitment | Is there a decrease in the population of species seeking refuge during dry or drought periods compared to baseline conditions? |  |  |  |
| Mortality | During the last drought, did large proportions of vegetation die and/ or did species population dwindle below average? |  |  |  |
| Mortality | Has there been loss of a endemic species or species listed asa sensitive, threatened, or endangered species associated with the GDE? |  |  |  |
| Ecosystem Structure & Function | Is there a growing density of non-native species? |  |  |  |
| Ecosystem Structure & Function | Do NDVI or NDWI maps show vegetation areas recovering in the wet years that follow a drought/dry period? |  |  |  |