Potential Source of the bug

The particular bug that we want to look at is the original issue (logit scale ignores limits when no data is plotted)
The tick locating and formatting is supported in /lib/matplotlib/ticker.py. So that's most likely where the bug is coming from. In ticker.py, there is LogitLocator class which is locator for logit scaling. Since the bug only happens with logit scaling, the bug should be from this class. Looking through the methods of LogitLocator class, I found 2 classes that has something to do with the max and min value of tick. They are tick_values and nonsingular.

according to the documentation:
tick_values(self, vmin, vmax)
    Return the values of the located ticks given vmin and vmax.
nonsingular(self, vmin, vmax)
    Expand a range as needed to avoid singularities.
The bug is very likely in the nonsingular function because it expands the range.

Impact on other part of the system

we don't think this bug will impact other parts of the system because the tick of logit scaling is just a relatively small and isolated part in the system.

Work Estimate

Software Design Phase [1 day] At the end of this stage, we've already analyzed the bug and have a understanding of the impact of the bug. The team will have a lead as to approximately where the bug is located and get a general idea of how to approach the fix to the bug. This stage would take about a day.

Implementing and Unit Testing Phase [~4 days] At the end of this stage, the bug will be fixed. Some unit testing will be conducted to make sure the fix we made indeed fix the bug and we are getting the expected resullt now. Also we have provided some edge case inputs to make sure the fix is robust. The implementation of bug fix will take arou d 3 days and the unit testing will take at most one day since the bug is easy to test.

Integration and System Testing [~1 days] At the end of this phase, the changes we made will have passed tests to make sure it does not impact other functionalities of matplotlib. This part of testing will take around one day because the bug is fairly isolated from other functionalities. It is not one of the core functions which has a lot of connections and dependencies with other parts of matplotlib.

Operation and Maintenance [<= 1 day] This is the last phase that we make a pull requast and see if our changes can be approved. Our task will be making the pull request and respond to any questions or comment on our implementation after that.