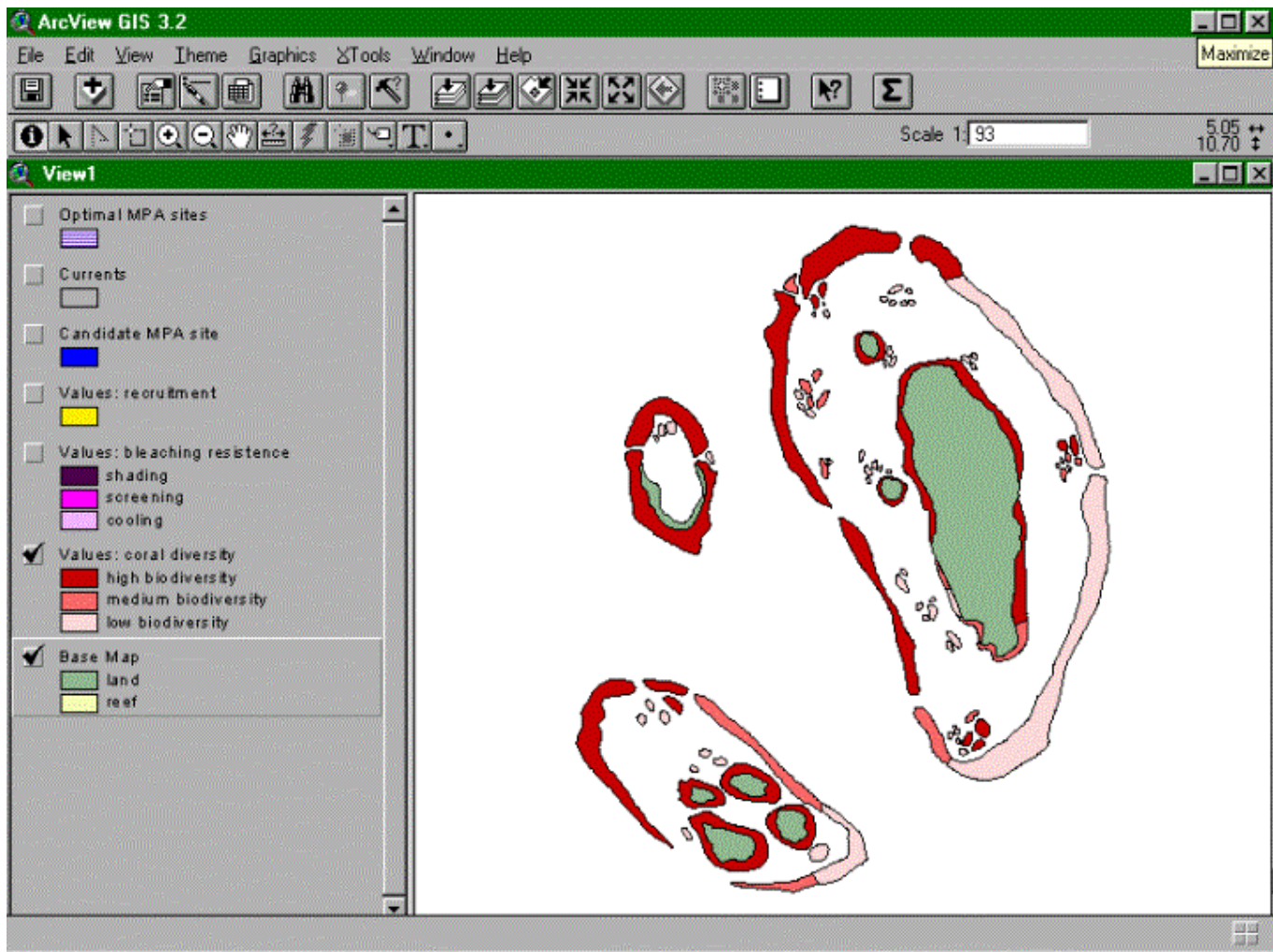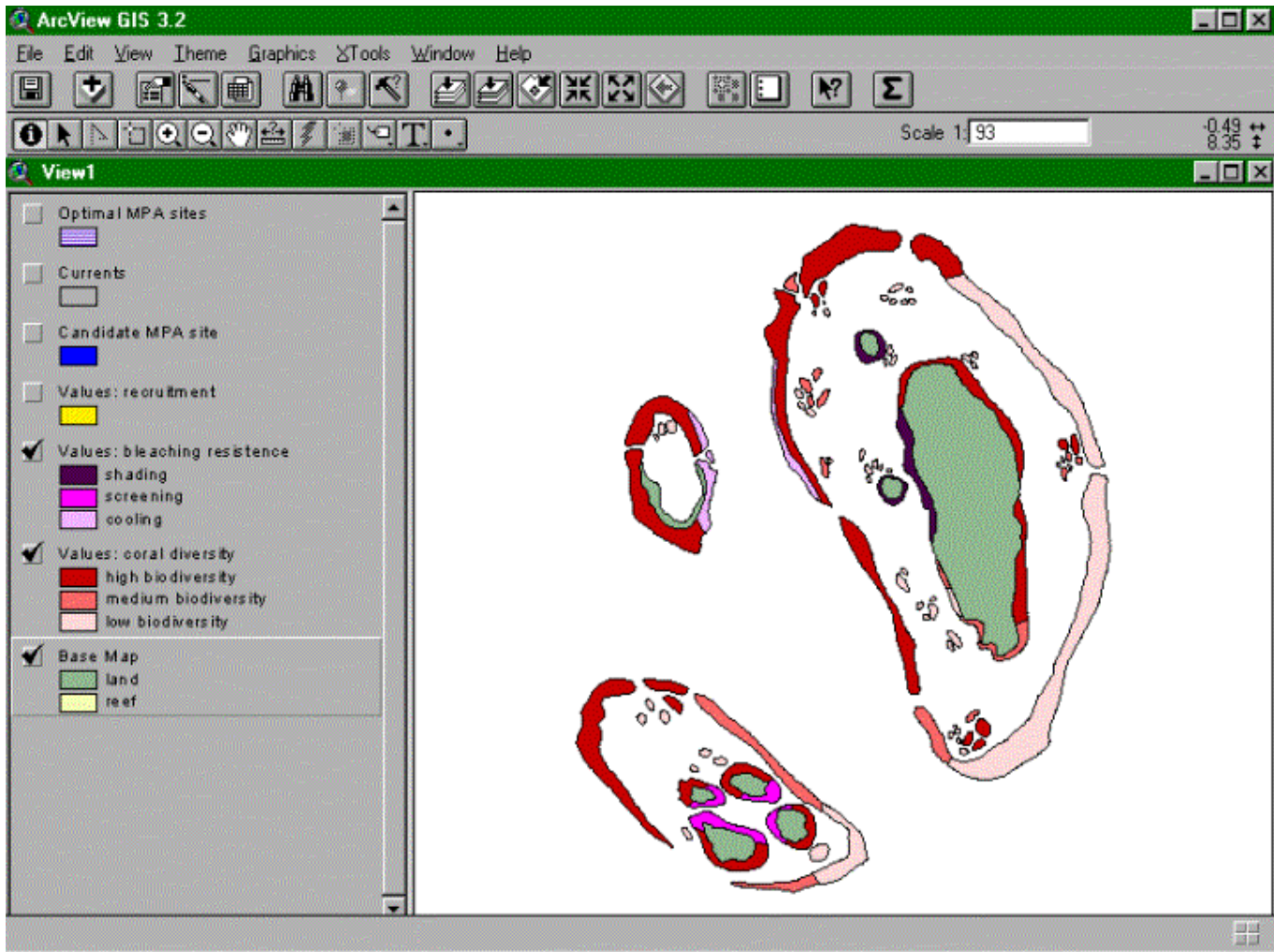1. Produce a base map showing the land and reef features.

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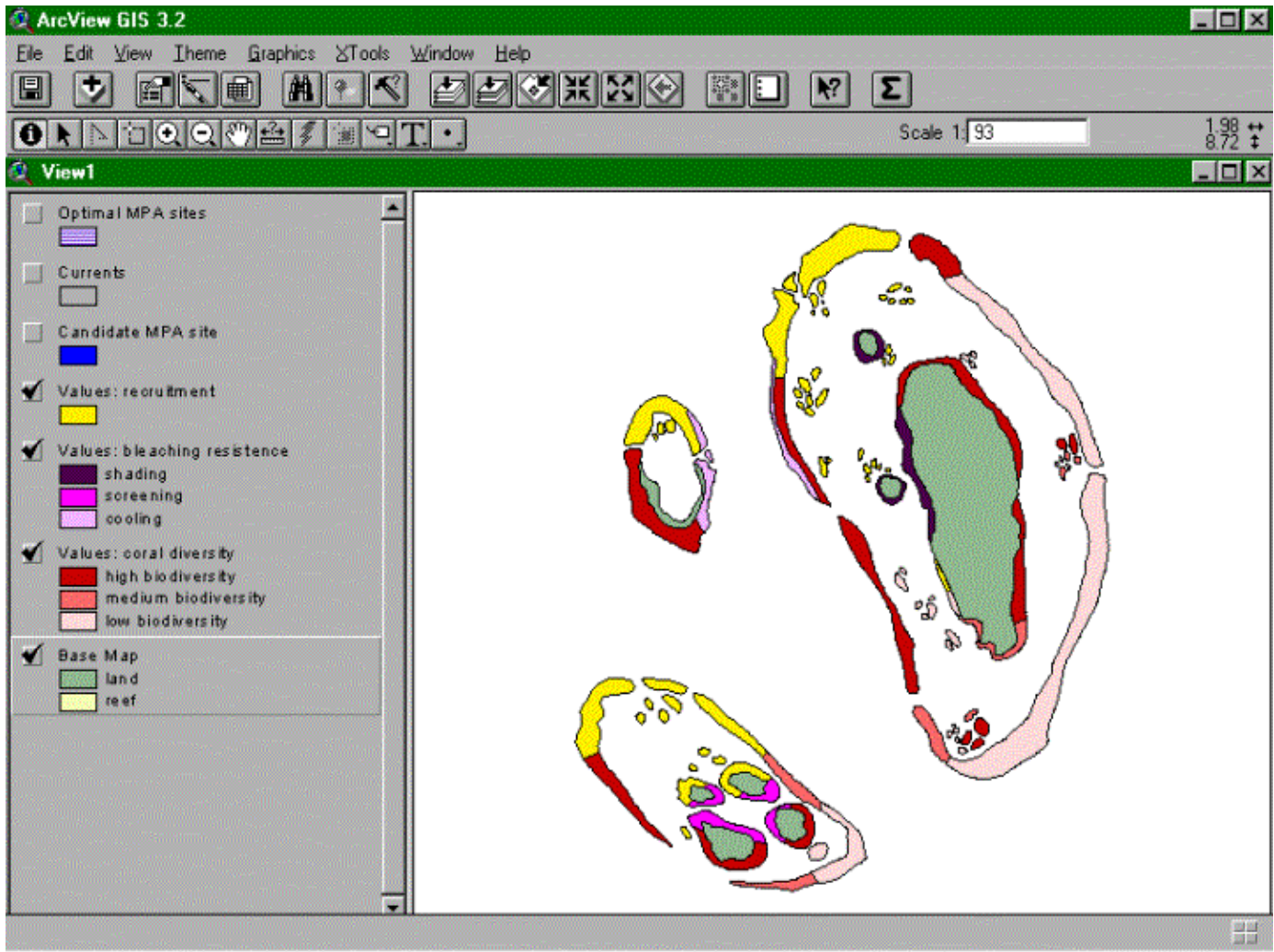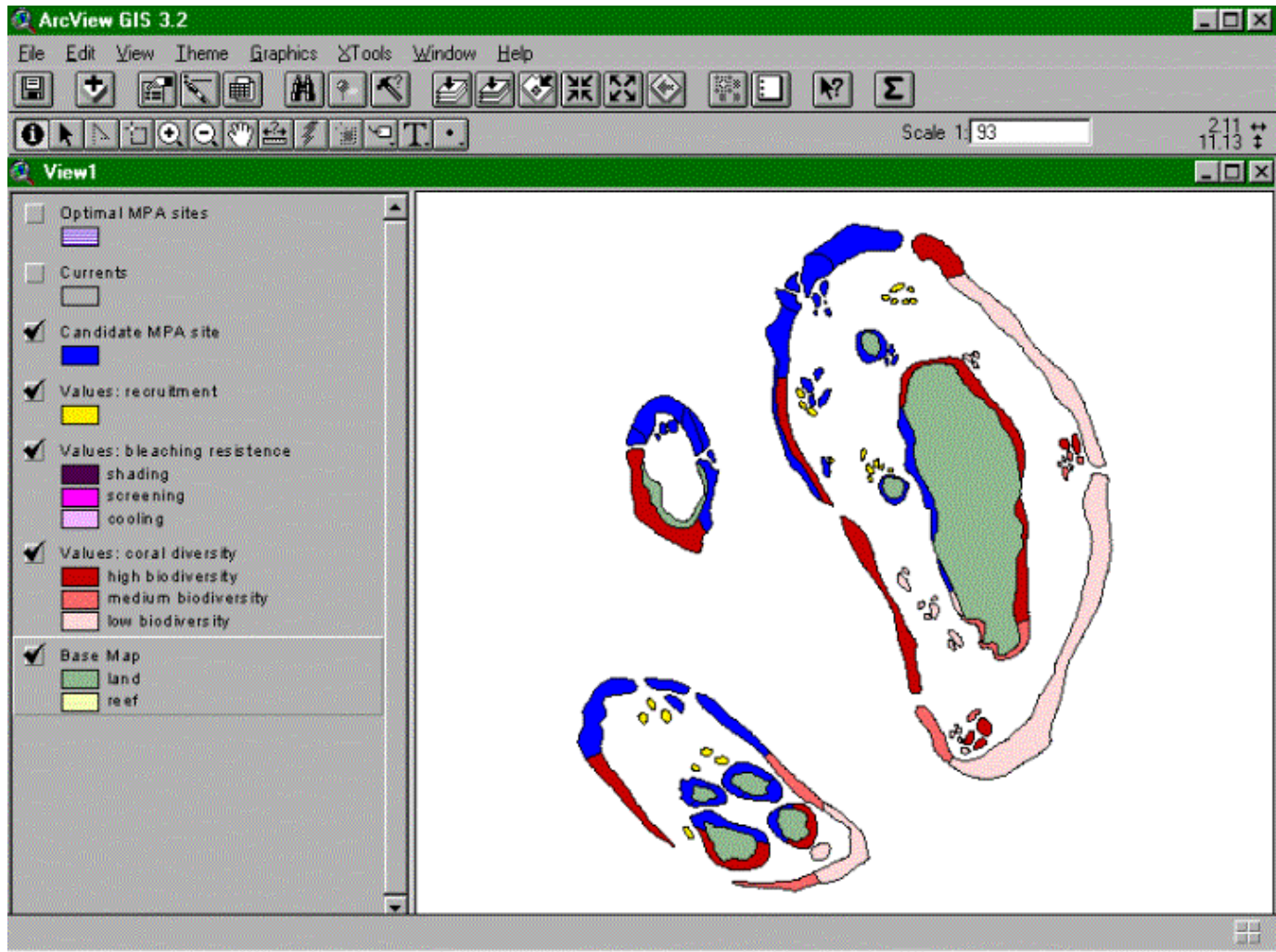
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ArcView GIS 3.2

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View1

- Optimal MPA sites
- Currents
- ✓ Candidate MPA site
- ✓ Values: recruitment
- ✓ Values: bleaching resistence
  - shading
  - screening
  - cooling
- ✓ Values: coral diversity
  - high biodiversity
  - medium biodiversity
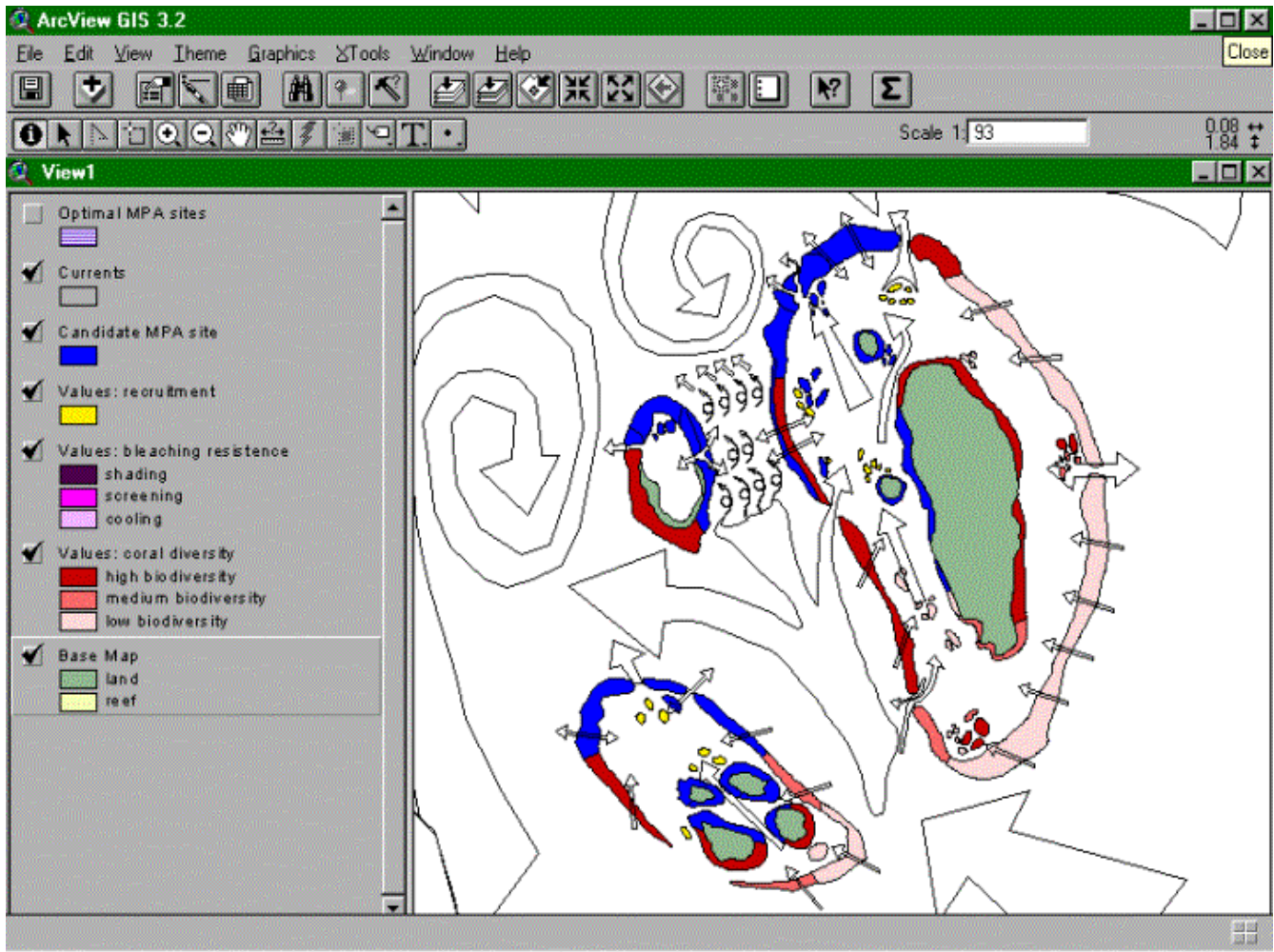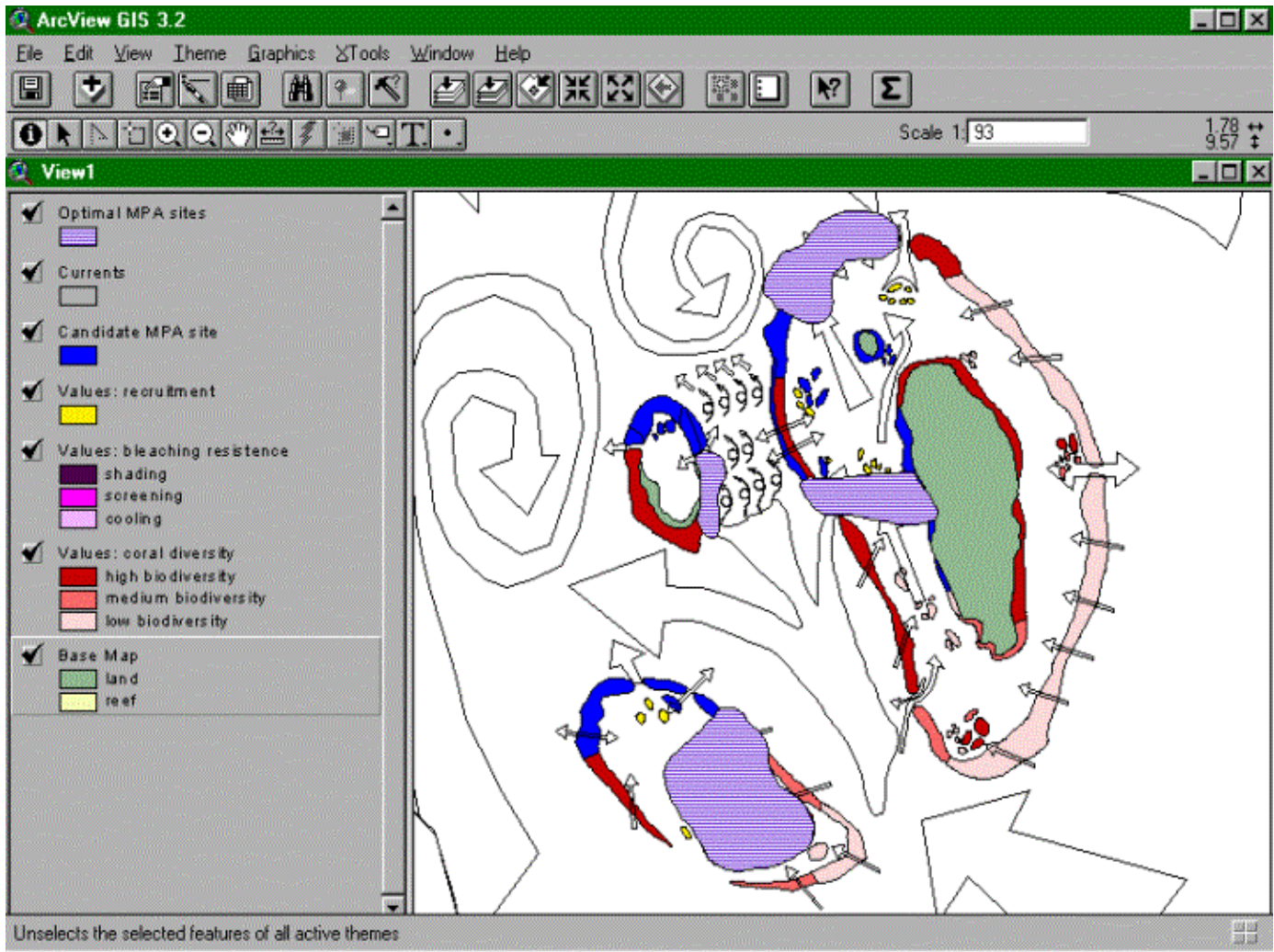 - low biodiversity
- ✓ Base Map
  - land
  - reef

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5. Identify candidate MPA sites based on a combination of values (in this case any site with high biodiversity value in combination with any other value; any medium biodiversity value site in combination with strong recruitment; some low biodiversity examples of lagoon patch reefs with strong recruitment to capture samples of these communities).

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6. Overlay current patterns to help identify potential corridors of connectivity. Since currents are important for larval transport and species movement. Link up source and sink reefs (reefs that supply coral larvae recruits to other reefs), and identify sites that are mutually replenishing (those that exchange coral recruits). These factors may be used as an aid to MPA network design to help select candidate sites and to identify areas for additional management actions outside MPA boundaries (such as pollution control).

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7. The optimal MPA sites include samples of reefs that resist bleaching because they are protected by different factors (in this case, one example each of reef complexes protected by cooling, shading and

screening). In addition, these sites are expanded wherever possible to include samples of high biodiversity and different reef types and their associated coral communities (in this case fringing, patch and barrier reefs). Together, these criteria help to ensure full representation of biodiversity by including a range of different reef types and spread the risk of complete loss from a mass bleaching event by also including a full range of different factors associated with bleaching resistance. Additionally, areas that are linked through currents should be considered in designing MPA networks that are mutually replenishing. These sites provide important refugia to seed areas damaged by mass bleaching.