Murrelet Survey Tool

## Potential Features

* ~~Move the behavior to before the group size in bird group data grid. Need to make the grid in edit mode by default, or capture key events for combo boxes.~~
* Add transect bearing and leg end points to raw data CSV (nearest transect point/bearing)
* Add perpendicular distance to bird group to derived data output
* Provide ability to edit an existing track log on the mobile device after creation.
* Issue a warning if taking an observation with a stale GPS point. I.e. the current GPS point hasn’t been update in some amount of time because of a lost signal. – put flag in database
* Add real time panning of the map to keep the boat in the center of the screen. The default solution for this problem is too slow. Try sub-classing the GPS display user control.
* ~~If GPS loses signal or issues an error, change the boat icon~~
* ~~Provide option to delete an observation on the mobile device (work around is to delete in ArcMap) – make subtle and protect from accidental usage~~
* ~~Add Track log length to raw data CSV export (with id)~~
* ~~CSV needs to be in chronological order~~
* ~~CSV need to have correct timestamp~~
* ~~Add web/GUI/console app to sync cache and read layer file and create CSV file.~~
* ~~Add ‘On Transect’ attribute to tracklog, to exclude tracklogs that are superfluous to final sampling area.~~
* ~~Add on transect, visibility, sea state, weather to small floating panel on map page.~~
* ~~Make grid key strokes visible during data entry~~
* ~~Remove leading zeros from angle/distance~~
* ~~Implement off transect alerts~~
* ~~Move weather/visibility/beaufort to the observation page.~~

## Bugs

* ~~When you create or edit an existing bird group the size is limited to 20 (should be 99). (workaround – change the constraint in the file geodatabase from 20 to 99 to match the constraint in the application).~~
* If you have more than one observation active in the edit observations page, and you have an invalid bird group (behavior = pending or group size != {1..99}) when you switch to another bird group in the edit page. Then the bird group grid for the observation with the invalid bird group will become corrupt. It will assume the identity of which ever observation you just switched from, however the page will display the invalid bird group error. Editing the bird group will change the observation you just switched from, not the current observation. (workaround – Use caution when editing multiple observations, and DO NOT switch observations when a bird group is invalid.)
* ~~In datagrid, keystroke in combo box cells does not initiate edit mode. (workaround use mouse, or key in group size, then tab to combo box cell)~~
* Keyboard entry issues on observations page
  + Space bar does not invoke new observation (workaround - use ctrl-n or click button)
  + Enter in angle or distance text box, when observation CANNOT be saved, does not save text and advance to next control when observation cannot be saved. (workaround - tab out of text box before pressing enter to save)
  + ~~Enter in angle or distance text box, when observation CAN be saved, does not save text before saving observation. (workaround - tab out of text box before pressing enter to save)~~
  + Enter does not save/close observation when focus is inside bird group data grid (workaround - use ctrl-s or click button)
  + Angle/Distance should validate on each key stroke, not just lost focus (workaround - tab out of text box to validate input)
  + ~~Mouse is required to focus in/out of bird group data grid (Implement ctrl-)~~
  + ~~When completing a bird group send the next character to the next birdgroup (works if group is complete, but not if it is only valid)~~
* Invalid database error when loading from project menu (workaround – close and reopen app)
* Deleting items via the identify tool in ArcGIS Mobile does not respect referential integrity. Remove Delete from identify menu. (workaround - do not use delete from identify menu)
* Occasional crash when connecting to GPS (Image should not return NAN as desired size) (workaround - close app and re-open)
* ~~Occasional null reference exception when Unloading GPS event handler (workaround - close app and re-open)~~
* ~~Selecting an observation for editing from the map doesn’t always work. Selecting a bird group seems to be fine. Increase selection extents~~
* ~~Loading an object created in previous session (i.e. not in our object cache), fails seemingly because we cannot recursively access the database. I.e. when we are loading a birdgroup, we load the associated observation, which loads the associated gps point, etc~~
* ~~Murrelet icon colors are not distinct enough~~
* ~~Fix problems with multi-threaded nature of GPS events~~
* ~~Enter in observation page does not validate the record~~
* ~~Invalid Angle/distance show error bezel but retain previous value (while showing invalid value). This allows page completion when it appears it should not.~~
* ~~Does not pan map to boat when we have a GPS signal~~
* ~~When I went off the map (or returned from an observation page?), the boat stopped drawing in the correct spot.~~
* ~~Map did not pan to keep boat in center~~
* ~~Actual point is to the top/left of the Boat~~
* ~~Save in observation, closed observation panel (should stay open if observation pending)~~
* ~~when I get a new observation that should be the active observation~~
* ~~Zoom while tracklog recording is messed up!~~
* ~~Do not post changes when quitting from main page or setup tracklog page (not recording)~~
* ~~Dragging to the NW quadrant while tracklog recording does not work!~~
* ~~Transect combobox selected item is not syncing with Task.CurrentTransect~~
* ~~Capture the quit event on all pages (or in task) and behave reasonably.~~
* ~~Page header flickers with GPS collecting~~
* ~~Can’t pan the map while observing (zoom in/out works)~~
* ~~Orientation is not by transect “queryNearestCoordinate” is null in getCoordinate~~
* ~~Cannot sync tracks,gps, observations – is there a problem with the PK-FK?~~
* ~~Use bearing from closest segment of transect in direction of travel. Currently using boat heading~~
* ~~Bearing from transects are incorrect. They are based on two point lines must go from start to finish (backwards not supported)~~
* ~~Closest transect is not being selected for the default – top transect on screen is.~~
* ~~List of Transects is not sorted – they are in database order~~
* ~~Create a new track log when stopping/starting~~
* ~~Birds as a property of Observations~~
* ~~Draw boat at current location~~
* ~~Limit available transects to those nearby or those on the map.~~
* ~~Do Not Save No Fix GPS points, do not add No FIX GPS points to the tracklog. Do not use for observations either.~~
* ~~Don’t start observing if there is no GPS fix.~~

## Programmer’s To Do List

* ~~Fix threading issues regarding GPS events~~
* Clear memory cache of GPSpoints when tracklog is saved.
* Test GPS failure scenarios
  + Lost signal
  + Unplugged
  + Out of batteries
* (FIXME #1 in BirdGroup.cs) sort out the difference between:

1. aborting the creation of a new object
2. canceling changes to an existing object
3. deleting an existing object

* Research the birdgroups binding errors on the console. – seems to work fine.
* ~~Merge birdgroup and birdgroup2 or Rename birdgroup2, refactor to be less temporary~~
* Consider implementing a Transect.Bearing property which returns null for a multi-segment bearing or fixed bearing for a single segment. Property must be set once at the start of the track log, and must have a valid boat bearing to determine the correct orientation. Therefore bearing is static for a tracklog, but can be re-evaluated at the beginning of each tracklog.
* Add triggers to delete methods to do cascading deletes of in memory objects and related features.
* ~~Develop protocol for exporting only relevant data to this years/days mission.~~
* ~~Cancel/Delete button on observation page is confusing. Aborts current observation (delete temporary record), Cancel’s editing changes if record was pre-existing.~~
* ~~Whenever an observation page is loaded, make the Angle field focus~~
* ~~Test that new observations that are not saved are not created.~~
* ~~Test – can I delete a bird group from an observation?~~
* ~~Only show observation queue if count > 1~~
* ~~Remove isvalid/iscomplete from birdgroup~~
* ~~Remove <transect name> from the tracklog page title~~
* ~~Test bearing by boat~~
* ~~(FIXME #1 in MobileUtilities.cs) Provide an error message and quit panel if feature layer is not found~~
* ~~(FIXME #2 in MobileUtilities.cs) Implement retrieving an existing feature from the feature layer~~
* ~~(FIXME #1 in Observations.cs) If an Observation is loaded by Guid, then it needs to load it’s related Bird Groups~~
* ~~(FIXME #2 in Observations.cs) Observation.FromPoint() can only load/edit points created in this process. If app stops/starts on same mission, then older points cannot be edited.~~
* ~~Remove ability to manage edits (does not honor relationships)~~
* ~~Check that all Feature layer names and column names are valid at startup. This will avoid a nasty surprise later if the database schema is changed without changing the application.~~
* ~~(FIXME #2 in BirdGroup.cs) Consider removing the FromGUID() calls to each database type. Need to differentiate GlobalID (autogenerated valid only until sync) with BirdGroupID (copy of autogenerated value, static forever, used as primary key). Comment applies to all tables~~
* ~~Make feature layer lookup based on database name, not ArcMap layer name.~~