

Air Power and the British Anti-Shipping Campaign in the Mediterranean, 1940-1944

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During the Second World War, the British conducted a sustained campaign of interdiction against Axis supply shipping in the Mediterranean Sea. Air power became a crucial component of this campaign, but was initially highly unsuccessful, delivering few results at a heavy cost. However, a combination of factors, including technical and tactical development, a greater allocation of resources and a higher level of priority being accorded to the campaign, led to vast improvements. By the end of the campaign, the British were conducting highly effective anti-shipping operations, and air power was vital to this in both intelligence gathering and strike roles.

Introduction

When Italy declared war on the Allies on 10 June 1940, it placed a heavy burden on their shipping to supply men and materiel (such as fuel, vehicles, ammunition and food) for their war in North Africa. The Italians and, later, Germans actually required a far greater network of maritime supply in the theatre than just this, however. Positions in Albania and later Greece were supplied through the Adriatic Sea, while territories in the Dodecanese islands required supply in the Aegean. The Aegean was also the route through which tanker traffic brought oil to Italy from the Ploesti fields in Romania.¹ Other island territories such as Sardinia, Corsica and Lampedusa were also sustained by maritime supply. Finally, coastal shipping plied routes along the various coasts of North Africa, Italy, France and the Balkans.

This opened an opportunity for the British to wage a campaign of interdiction against this vital network of supply, in order to degrade the combat ability of the Italian forces in North Africa, which became the main focus of the campaign. The anti-shipping campaign has been depicted by various historians as only existing to interdict shipping to North Africa, and ceasing after the final Axis surrender there.² However, the campaign was later widened to assist in preparation for the invasions of Axis territories such as Pantellaria, Sicily, Italy, and the Dodecanese islands. Other supply routes in the Adriatic, Aegean and Northern Mediterranean were also attacked. Air power was to become a key component in the anti-shipping campaign, but British maritime air power in the Mediterranean theatre was in a dire state in 1940.

This article will demonstrate that initial efforts were few and often dismal failures, as the Royal Air Force (RAF) operated small numbers of unsuitable aircraft types for anti-shipping attacks. The low priority of maritime operations in the interwar years also meant that they lacked effective tactical doctrine for such operations. Meanwhile, the Fleet Air Arm (FAA) was much better in all these respects, but simply lacked the numbers to have a great effect. However, after a greater priority was accorded to anti-shipping operations, significant reinforcements of more specialised aircraft types became available, and marked technical and tactical improvements were made, the campaign became much more effectively prosecuted. From late 1942 onwards, air power was the most important contributor to the campaign, both statistically in terms of sinkings and less direct roles such as intelligence gathering.

The Early Campaign, June 1940 – March 1941

On 10 June the only dedicated maritime strike aircraft available in the theatre were 18 Fairey Swordfish of the FAA aboard the aircraft carrier HMS *Eagle*.³ The RAF not only lacked strike aircraft in the theatre, but dedicated maritime aircraft more generally. RAF Middle East command had fewer than 260 combat ready aircraft at that stage to cover an area stretching from Malta to Kenya to Iraq. The problem of a severe shortage of aircraft was compounded by many of the aircraft being second-rate or even obsolete types, such as Gloucester Gladiator

biplane fighters and Vickers Wellesly bombers.⁴ Reinforcements were unlikely to appear in the immediate future, with the RAF focused on the defense of the United Kingdom. The only assistance that the RAF could offer at the start of the campaign was the use of a handful of reconnaissance aircraft and flying boats based in Alexandria for maritime purposes, and the bombing of Axis ports.⁵

The paucity and quality of maritime aircraft was compounded by the low priority the Air Ministry accorded maritime operations in the Mediterranean. A signal to Air Officer Commanding in Chief (AOC-in-C) RAF ME Air Chief Marshal (ACM) Arthur Longmore, stated his instructions for the use of the resources under his command as follows:

‘The primary role of forces under your command is the defence of Egypt and the Suez Canal, and the maintenance of communications with the Red Sea. This however does not preclude the possibility of air forces from your command being employed in the execution of such other plans as may be approved by the chiefs of staff from time to time.’⁶

Clearly, then, the opinion of the Air Ministry was that the air force should be utilised in North Africa to defend the British position in Egypt. Maritime operations, even those that contributed directly to the war in North Africa, were not a high priority.

Longmore, a former member of the Royal Naval Air Service and AOC-in-C RAF Coastal Command, was very much an advocate of maritime operations, and sought ways for RAF ME to play a greater role in them despite these constraints. Taking a very wide interpretation of his instructions, he laid down the following objectives for the command, with their priority at any one time dependent on the current situation:

1. Offensive action against air bases with a view to reducing their numerical superiority in aircraft and to destroy their repair operation.
2. Offensive action against ports, to destroy or damage submarines, shipping and facilities.
3. Destruction of resources in Italian East Africa, where it was anticipated no replacements can be made.
4. Full support of British armies in whatever operations are in progress.
5. Strategical reconnaissance for naval, army and air information.⁷

Evidently, Longmore took a holistic approach to the use of air power in the theatre, wishing to utilise it in support of both the other services as well as in its own right in a battle for aerial superiority. This included a direct role in the anti-shipping campaign both by attacking ports and through maritime reconnaissance. The Naval Commander in Chief, Mediterranean, Admiral Andrew Cunningham clearly appreciated the efforts of Longmore and co-operation between the two was often close, with support being leant both ways.⁸

There was one final obstacle to conducting anti-shipping operations in the Mediterranean in June 1940, which extended to both the RAF and the Royal Navy – they were not permitted. Britain had entered the Second World War with a ‘stop and search’ policy regarding enemy controlled and neutral merchant shipping.⁹ This meant that British forces, whether surface vessels, submarines or aircraft, could not attack merchant vessels. Instead, they should challenge the vessel, stop it and search it for contraband. If any were found, a prize crew could be placed aboard to sail the captured vessel back to a friendly port. Merchant vessels could only be attacked if they refused to halt and ignored subsequent warnings. The rules were even more restrictive for aircraft. The Air Ministry decreed in February 1940 that only warships could be attacked. Other vessels could not even be challenged unless they were specifically being searched for under orders from the Ministry, in which case the highly impractical instructions were to divert the vessel from its destination. The instructions even went so far as to state that aircraft should not act in a way that might provoke defensively armed merchant shipping into firing on them.¹⁰ During the German invasion of Norway in April, British policy regarding attacks on merchant shipping started to be relaxed, with the declaration of ‘sink at sight’ zones in Scandinavian waters, and later the Channel and the Bay of Biscay. Initially they were allowed only on vessels determined to be the rather ambiguous ‘naval auxiliaries’, but this was soon changed to any enemy controlled vessel.¹¹

At the outbreak of war in the Mediterranean, no ‘sink at sight’ zones were declared, despite their existence in the waters of Northwest Europe and the obvious need of the Italians to supply their forces in North Africa by sea. Admiral Cunningham had called for approval to attack the Italian merchant marine vessels when it became clear war with them was inevitable. This became more urgent after the sinking of a Norwegian tanker without warning by an Italian submarine, just three days after their declaration of war.¹² It was not until 14 July 1940 that a ‘sink at sight’ zone was approved for up to 30 miles off the Libyan coast. This increased to vessels within 30 miles of any Italian territory three days later.¹³ The Adriatic and Aegean seas were declared open for attacks in February and June 1941 respectively, after which attacks were allowed in almost the entire Mediterranean.¹⁴

With problems of numbers and types of aircraft, intelligence gathering ability, a low priority for maritime operations and restrictions placed on attacking merchant shipping, it is hardly surprising air power achieved little in the early anti-shipping campaign. The problem of locating shipping for attacks was a difficult one. The lack of reconnaissance aircraft made it difficult both to determine how busy Axis ports were for potential bombing attacks and for locating targets for attacks at sea by aircraft or any other means. This was exacerbated by difficulties in gathering both signals and human intelligence (SIGINT and HUMINT). Since 1937, British signals intelligence had cracked multiple Italian cyphers including those of the navy. They were able to read both the most secret and the general book of their cyphers, plus one of their two naval attaché codes. Intelligence from these sources in particular allowed them to build up an accurate picture of Italian naval and shipping sailings and movements up until mid-July 1940. At this point the Navy became the last of the three

Italian services to introduce new codes and tables after the outbreak of war; this would have come earlier if not for the capture of a copy of the proposed new general book with the Submarine *Uebi Scebeli* at the end of June.¹⁵ Although the British retained an intermittent ability to read Italian low grade codes and ciphers, signals intelligence regarding Italian naval matters was very thin following the tightened security measures. Italy's main naval book ciphers were in fact never read again, with the exception of a brief period in June 1941 thanks to some captured documents.¹⁶ Regarding human intelligence, the networks of agents and partisans in Greece and Yugoslavia, that would later play a notable role in the campaign, had yet to exist.

The role of attacking shipping directly at sea by air power fell to the FAA in the early campaign. As a dedicated maritime air force, they had developed successful tactical doctrine for torpedo attacks on vessels in port and at sea.¹⁷ On 19 June 1940, the first squadron of Swordfish were transferred to Malta from North Africa.¹⁸ These 12 biplanes represented the main aerial anti-shipping effort for much of the early campaign, although aircraft carrier strikes on ports did occur in this period as well, such as a raid on Augusta by aircraft operating out of HMS *Eagle* in July. Here the FAA sank four merchant vessels of 26,773 Gross Registered Tons (GRT).¹⁹ Such operations were a rarity however, as aircraft carriers were primarily used for major fleet actions against the Italian navy in this period. The biggest FAA strike on a Mediterranean port in 1940 was the famous strike on the Italian Fleet at its base in Taranto – merchant shipping was very much taking a back seat.

From June 1940 up to and including March 1941, air power sank 24 merchant vessels of all types, at total of 68,872 GRT.²⁰ The FAA accounted for almost all of the sinkings that occurred at sea in this period, as well as several vessels sunk in port. The RAF did manage to make a substantial contribution through port bombing, most notably sinking five vessels in multiple raids on Axis ports in December.²¹ At an average of just over two vessels sunk per month in the early campaign, sinkings were relatively few in this period. The experience of the FAA in torpedo bombing operations was highlighted by the fact that they lost only five aircraft, while the RAF had 35 aircraft destroyed or damaged beyond repair.²² The early campaign had brought modest successes, certainly not sufficient to make a notable impact on Italian land operations or shipping capacity. They had, for the RAF at least, been very costly however. From March 1941 though, the whole approach to the campaign began to change.

The Developing Campaign and the Axis Counter Offensive, March 1941 – September 1942

From March 1941 onwards, the anti-shipping campaign was accorded a higher priority in British strategy. The threat of invasion of the United Kingdom had largely diminished, allowing greater resources to be allocated to the Mediterranean and North Africa. The theatre represented an opportunity for the British to gain some much needed morale-boosting victories over an Italian opponent that was perceived to be much weaker militarily than Germany, as well as to defend the vital Suez canal link to the Middle and

Far East. Churchill decreed in April that the navy should take an increased role in the interdiction of Axis shipping, beyond the effort that had so far been restricted to submarine and FAA attacks:

‘...the primary duty of the British Mediterranean Fleet...to stop all sea-borne traffic between Italy and Africa... Every convoy that gets through must be considered a serious naval failure. The reputation of the Royal Navy is engaged in stopping this traffic.’²³

Such ‘encouragement’ from Churchill resulted in a dedicated anti-shipping task force of cruisers and destroyers (Force ‘K’) being based at Malta. The aerial campaign was also stepped up, with a very important influx of aircraft to the theatre in March – the arrival of the first RAF torpedo bombers. Seven Bristol Beauforts were transferred to Malta and formed a joint reconnaissance/strike squadron (No. 69 Squadron) with some new Glen Martin reconnaissance aircraft.²⁴ For the first time in the theatre, the RAF could make torpedo attacks on targets at sea. RAF strike aircraft were reinforced several times throughout 1941, often being transferred directly from Coastal Command, which demonstrated the greater importance of this campaign than the one in Northwest Europe in the eyes of the Cabinet.²⁵

By July 1941, the RAF had 67 maritime strike aircraft available in the Mediterranean; a mix of types including new Bristol Beaufighters, which would later become an important asset in the campaign. The FAA had no fewer than 99 strike aircraft distributed around the theatre at the same point.²⁶ These aircraft were not purely dedicated to anti-shipping operations, or even always to maritime operations. Even the FAA aircraft were frequently used in co-operation with the army in North Africa. Nevertheless, the number of anti-shipping strikes conducted by the aircraft of both services was increasing, with the FAA in particular conducting a greater proportion of torpedo strikes.²⁷ The decision was also made for the RAF to start conducting aerial mining of Axis ports in May, with the first sortie by Vickers Wellington bombers of No. 38 Squadron against Benghazi on the night of 15/16 July.²⁸ This period saw further development of Malta as a base for aerial strike forces. On 1 June, Hugh Lloyd was installed as AOC Malta with the instructions that his primary task was ‘...to sink Axis shipping sailing from Europe to North Africa.’²⁹ He immediately set to work improving the spartan and unsuitable facilities there, including moving storage facilities underground from their previously vulnerable positions.³⁰ Anti-shipping strikes by FAA Swordfish and RAF Blenheim bombers, along with naval assets, increased in intensity.

Increases in maritime aircraft and the priority of the campaign were supplemented by breakthroughs in intelligence. In June 1941 the Italian C38m cypher was broken by ULTRA decryption. This gave the British advance notice of the departure dates of almost every Italian convoy and individual sailing, often including the composition and projected routes as well.³¹ This allowed British air and naval forces to directly target assigned vessels known to be at sea, rather than conducting ‘shipping sweeps’ for potential targets. They were further assisted in the location of these targets by an increase of reconnaissance aircraft. It has already been

mentioned that the first seven Marylands arrived at Malta in May, and this number was quickly increased to 23, although losses and transferrals soon wore the total down by almost half.³²

While the role of the RAF in the campaign had increased from a peripheral to a more direct one by the middle of 1941, June saw an important leadership change. Longmore was succeeded as AOC-in-C RAF Middle East by AM Arthur Tedder. While Tedder, like Longmore, appreciated the necessity for maritime air power, he was much less flexible in terms of direct co-operation with the navy. One of the reasons that Longmore and Cunningham shared such a good relationship was that they frequently offered the use of their respective forces for co-operation with the other service freely. This went so far as at times surrendering operational control of air units to the other commander.³³ Tedder, perhaps understandably with resources still inadequate to the many tasks of his command, was unwilling to go to such lengths. It was his viewpoint that '...naval air operations cannot properly be considered as a self-contained activity separate from the main land and air operation in the Middle East'.³⁴ Tedder was unwilling to offer dedicated support for the Navy that was repeatedly requested by Cunningham, rather only co-operation for specific operations that had his approval.³⁵

The increasingly fractious relationship between the two reached a peak over the question of the creation of an equivalent to Coastal Command for the Mediterranean and Middle East. The dispute flared on the spot and in London, with Cunningham having the backing of the First Sea Lord, Dudley Pound while, Tedder was largely supported by the Air Ministry. Ultimately a compromise was reached in the creation of a RAF No. 201 (Naval Co-operation) Unit. This was a dedicated maritime unit that covered the Central and Eastern Mediterranean, and included both RAF and FAA units in the same command. Tedder retained operational control of the group, but Cunningham held the right to 'veto' operations which he did not agree with.³⁶ While the dispute certainly slowed the building of momentum in the campaign, the creation of the group did increase the role of the RAF in maritime operations under Tedder and provide dedicated training in maritime operations for RAF aircrews.

For the RAF, there was no tactical doctrine on attacking shipping directly at sea when they entered the war. This was a legacy of the neglect accorded to this aspect of maritime aviation by the RAF, and the only experience of land based air power was that developed in the early stages of Coastal Command's anti-shipping campaign in Northwest Europe. Despite being a theatre with completely different geographical, climatic and strategic circumstances, the initial doctrine developed in the Mediterranean was partially based on it.³⁷ The procedure was very similar to the one used for locating friendly convoys for aerial escort. It required a reconnaissance aircraft to search a 'box' area where targets were calculated to be, based on intelligence. The aircraft would take the laborious approach of flying circuits up and down the 'box' until a target was located or the search completed unsuccessfully. In the case of the latter, the aircrew would make a judgement whether to widen the search area or return to base. On the location of a target, the searching aircraft would signal for the despatch of a striking force to attack it.³⁸

With the lack of reconnaissance aircraft available until late 1941, the searching role often had to be performed by whatever aircraft were to hand. This even included strike aircraft doubling in this role, thus decreasing the range and endurance of the search, and depleting the potential strike force. The searching method was laborious and initially required the target to be located visually, meaning night strikes were particularly difficult. When targets were successfully located, it was not uncommon for the strike aircraft to fail to find it and the searching aircraft. An operational research report found that strike aircraft operating without technological assistance located their targets just 33 per cent of the time during daylight sorties.³⁹ However, technological developments brought notable improvements in the search and strike procedure. From mid 1941 onwards, Air to Surface Vessel (ASV) radar sets became available in the theatre. These greatly aided searching aircraft in the location of targets, and allowed a much greater emphasis to be placed on night strikes. This was complemented by the implementation of 'Rooster' sets around the same time. When a searching aircraft located a target and signalled for a strike force, it could switch on the 'Rooster' set. This would activate a signal that could be 'homed onto' by strike aircraft that carried ASV sets, and led to a marked increase in the number of strike sorties successfully reaching the location of the search aircraft and thus the intended target.

The improvements in aircraft types and availability, technological assistance and tactical development along with an increased priority combined to deliver improved results for the aerial anti-shipping campaign. The period from June to November 1941 saw a marked and sustained increase in the number of sinkings by the FAA and RAF. Between seven and 11 merchant vessels were sunk in each month and these were often of a significant tonnage. In the greatest single month of the campaign so far, 11 vessels of 35,196 GRT were sunk in August.⁴⁰ However, the glut of sinkings was abruptly arrested at the end of the year.

The Air Korps of Fliegerkorps II was transferred from the eastern front to Sicily, arriving from late November onwards. The highly experienced Albert Kesselring was also installed as the German C-in-C South in Italy, and one of his tasks was the neutralisation of Malta. Kesselring immediately brought huge pressure to bear on the island in the form of sustained large-scale bombing raids. For instance, there were 263 air raids on the island in the month of January 1942 alone.⁴¹ The Germans, along with some assistance by Italian aircraft, quickly established aerial superiority through the intensified bombing of the major Maltese aerodromes at Hal Far, Luqa and Ta'Qali. The result was the operability of both offensive and defensive air forces on the island being largely curtailed. Thirty strike aircraft were shot down in November and December 1941, along with several reconnaissance aircraft, a rate of attrition that simply could not be sustained.⁴² The fighters stationed there for aerial defence suffered particularly heavily. A lack of equipment that provided sufficiently early warning of raids and facilities that were still not adequately equipped for resistance to bombing despite the efforts of Hugh Lloyd led to 160 aircraft of all types being destroyed on the ground, and another 231 damaged over the course of the siege, the majority of them fighters.⁴³

January 1943 saw a great drop in the number of losses in strike aircraft while on sorties, and with the exceptions of February and July, losses were low for the entire siege. This was not due to improvements in any aspect of operations, but simply because there were far fewer shipping strikes being flown.⁴⁴ Very few were flown out of Malta in this period due to previous losses in aircraft both on sorties and on the ground, the damage to airfields, facilities and equipment, the ongoing nature of the air raids hampering take offs and landings and the difficulty of bringing in new aircraft, personnel and vital supplies such as fuel and spares. The total number of strike aircraft in the theatre did increase in the first half of 1942, but these had to be sent to areas that were not ideally positioned for anti-shipping operations. Many of them were ultimately used for other tasks in this period, particularly during the series of critical British reverses in North Africa.⁴⁵ The role of air power in anti-shipping operations was consigned to some FAA sorties from Malta at night, and longer ranged RAF aircraft such as torpedo equipped Wellingtons operating from Egypt. As the siege wore on, the fuel shortage became particularly acute and the Chiefs of Staff were forced to order that '...strikes from Malta must be reduced to an absolute minimum, e.g. extremely good chances at close ranges. Transits except for Beaufort will cease'.⁴⁶ Thus dedicated maritime units stood relatively idle, while some were co-opted into roles supporting the land campaign.

This period marked the low point of the anti-shipping campaign as a whole, with the 10th Submarine Flotilla and the surface units of Force K both being withdrawn from Malta. Few mining operations were able to be conducted by surface vessels, submarines or aircraft. However, the strangulation of aerial operations probably hurt the campaign the most, as not only were aerial shipping strikes curtailed but so too was maritime aerial reconnaissance. The decline in the number of operations from any method was exacerbated by the simultaneous lack of intelligence to guide them. It is hardly surprising then, that sinkings were so few during the siege. From January to June inclusive, just 11 merchant vessels (55,713 GRT) of all types were sunk. In terms of numbers sunk, if not tonnage, these six months were equal to August 1941 alone.

There was one positive development during this period; in the form of an improved tactical doctrine. By May 1942 comprehensive procedure for torpedo strikes had been set down for daylight operations in the Mediterranean. The procedure emphasised the importance of the strike force flying in formation at low altitude (generally 50 to 100 feet) in order to avoid possible RDF detection by the target. This also assisted in conforming to ideal torpedo dropping heights in advance of reaching the target, made them less visually and audibly detectable, and helped avoid the attention of escorting enemy aircraft.⁴⁷ After the siege, when sufficient forces were available, this was developed further to include the use of aerial escorts to the striking force. The strike force of torpedo bombers (in this case intended to be Beauforts or torpedo armed Beaufighters, known as 'Torbeaus') would then attack the targets. Meanwhile, an escorting force (intended at this stage to be Beaufighters) would either engage any aerial escort present or attack the escorting vessels of the convoy in an 'anti-flak' role, in order to protect the strike force as it made the attack.⁴⁸ While the initial tactics used in the

Mediterranean had simply mimicked those used by Coastal Command in Home waters, these newly developed tactics were a forerunner of the 'Strike Wings' that were to be fully developed by the anti-shipping forces of Coastal Command in late 1943.⁴⁹

It took a combination of British and German actions to bring both priority and efficacy back to the campaign. First, in August the famed 'Pedestal' convoy fought its way through to resupply Malta. The arrival of the surviving convoy vessels has been presented in popular culture as the final reprieve of the island, allowing the full and immediate restoration of its fighting capacity. It is certainly likely that without the arrival of the convoy, the island would have fallen. The governor of the island had estimated that when it arrived, they were just 10 days from surrender through lack of supplies.⁵⁰ However, nine of the 14 merchant vessels were lost to combined Axis efforts, meaning the majority of the supplies did not get through. The survival of the tanker *Ohio* ensured a significant resupply of heavily depleted fuel stocks, but this still needed to be rationed – restrictions on shipping strikes were relaxed but not entirely removed at that stage, it was considered enough for around 2 months of operations by submarines and aircraft.⁵¹ Malta was not restored to full striking capacity until the arrival of the next convoy ('Stoneage') in November.⁵² Nonetheless, the number of strikes conducted from the island began to increase significantly after 'Pedestal'.

Second, while 'Pedestal' had seen heavy losses to the British naval and merchant forces, German and Italian aircraft also suffered significantly. An estimated total of 62 Axis aircraft were lost during the operation, and the aerial siege of Malta quickly ebbed in intensity after this. Luftwaffe units based in Sicily and southern Italy curtailed their offensive operations, while some were transferred to the eastern front. Not only had 'Pedestal' been crucial in the revival of Malta's capability, it played a great role in the end of the siege itself. Finally, the Axis advance across North Africa was first halted and then reversed at the various battles of Alam Halfa and El Alamein between July and October. The British and Commonwealth forces quickly regained the strategically important airfields of Cyrenaica. These successes were quickly followed by the landing of American and British forces in northwest Africa; Operation 'Torch'. In February 1943, the Northwest African Air Forces (NAAF) were set up as an umbrella command for all Allied air forces now present in the northwest. The NAAF comprised three distinct commands; strategic, tactical and coastal. The Northwest African Coastal Air Force (NACAF) represented the first dedicated maritime air force in the theatre. With Axis air power heavily degraded in both North Africa and Italy, strategically important airfields gained both to the east and west of Axis positions and a great influx of reinforcements from the RAF and USAAF, the Allies had gained aerial superiority over the Mediterranean.

The Period of Allied Dominance, October 1942 to the end of the Campaign

With aerial superiority over the majority of the Mediterranean, other than the Adriatic and Aegean seas, the campaign could reach its full potential. The Allies descended upon the Axis supply routes to western Libya and Tunisia with the full force of the resources available

to them. Dedicated naval task forces of cruisers and destroyers patrolled the routes, coastal forces, submarines and aircraft operated out of Malta and Algerian and Tunisian ports. Mines were also laid from surface, submarine and aerial units in what had become a truly combined arms offensive. Both Axis air and sea power had been heavily degraded by this stage. The withdrawal of aerial forces in Italy and a lack of reinforcements to North Africa meant that Axis convoys were escorted much more weakly by aircraft. Whereas over autumn 1942 convoys on the Greek coast received an average of 25 total aircraft over the course of their journey, in December they averaged just five off the Tunisian coast.⁵³ Despite the heavy losses to Italian light forces over the course of the war and their lack of sufficient naval construction capacity, they managed to continue heavily escorting convoys to Tunisia. They were aided greatly in this by the much shorter nature of this route than the one to Libya. Between 1940 and 1942 convoys to Tripoli had generally consisted of between three and six merchant vessels or tankers, escorted by three to four warships, usually destroyers or large torpedo boats.⁵⁴ Convoys to Tripoli in late 1942 through to the fall of the port in January 1943 tended to be escorted much more lightly by the overstretched Italian navy. On the much shorter route between Sicily and Tunisia though, a single ship would have two escorts, two vessels might have a third escort and three vessels would receive protection from three or four escorts.⁵⁵

Despite the efforts of the Italian navy, the escorts they were providing at this stage were often vessels pressed into service sporting damage that was not fully repaired, or a few new vessels that were not yet fully worked up. Thanks to the casualties suffered from a relatively small pool of experienced officers and men, the crews were often less experienced and in some cases lacked full training. Allied Italian warships lacked particularly effective anti-aircraft armaments in general, and it was the threat from aircraft they were least capable of dealing with.⁵⁶ This made the lack of available escort aircraft all the more keenly felt. The courage and willingness to fight of the Italians has been questioned by many, but their continued efforts to supply the dwindling position in Tunisia in 1943 in the face of overwhelming odds flies in the face of such criticism. In recognition of the successes of the campaign at this stage, the supply route to Tunisia was dubbed by Italian sailors as 'the route of death'.⁵⁷

On 13 May 1943 the last of the Axis forces in North Africa surrendered. Over 275,000 prisoners of war were taken, along with their equipment, in what has been nicknamed 'Tunisgrad'. Between 1 November 1942 and 30 April 1943, a total of 387 Axis merchant ships and tankers were sunk in the Mediterranean. Of the 387 sinkings, 185 (48 per cent) were directly sunk by aircraft, the next highest total were submarines with 159 sinkings (41 per cent). The remaining 43 vessels were sunk by either warships or mining. In terms of the tonnages of sinking over this period, aircraft accounted for 292,485 (46 per cent) of the total 639,885 GRT sunk. Sinkings by submarine totalled 273,879 GRT, 42 per cent of the overall total.⁵⁸ It was aircraft that made the greatest contribution to this crucial period of the anti-shipping campaign. Not only had they sunk the largest number and tonnage of vessels, they had played a crucial role in intelligence gathering and the maintenance of aerial superiority to aid sinkings by all methods.

As mentioned in the introduction, the conclusion of the North African campaign did not signal the end of the anti-shipping campaign but rather the remainder of it has largely been ignored in history to date due to its more peripheral nature in the war in the Mediterranean. In fact, sinking of merchant vessels in the Mediterranean reached their peak in the period around and after the Axis surrender in North Africa. There were 118 sinkings in May 1943, the greatest single month of the campaign, even though the majority of them came after the surrender. This was also the greatest single month for sinkings by aircraft, at 94 vessels.⁵⁹ Sinking levels remained significant for the rest of 1943, although the proportion sunk by aircraft dropped heavily after September. This was largely due to the re-purposing of aircraft that had been used for anti-shipping operations to air operations over Italy, and the Dodecanese campaign of September-November. The Aegean remained one of the few areas of the Mediterranean where the Axis retained aerial superiority, and it was out of the range of single-engine fighters at that stage. The FAA could play no role in the campaign at all, while RAF Beaufighters were able to patrol over the sea only for short periods of time and were easily outclassed by the higher performance single-engine fighters of the Luftwaffe. They sustained heavy losses and achieved few successes against German convoys carrying troops and supplies to retake the islands from the British.⁶⁰

Despite the heavy losses that the Italian merchant marine had sustained since June 1940, a significant anti-shipping campaign was still conducted during 1944. While the Italian armistice in September 1943 meant that they would surrender their remaining merchant fleet, the Germans acted quickly and were actually able to seize the majority of the tonnage available. Of the 272 vessels of 748,578 tons that remained at the time of the Italian armistice, over 210,000 tons was surrendered to or seized by the Allies, although the actual number of vessels is unknown.⁶¹ The Germans managed to seize around 535,000 tons of shipping plus numerous smaller vessels of under 500 tons that have gone unrecorded. Although they had seized many of the choicest larger merchant vessels, the Germans had been left with a rather motley collection of former Italian, French and Greek vessels along with some of their own shipping that had survived the campaign. With the fall of Italy, they lacked the facilities in the theatre to construct full merchant vessels, although they were able to construct small numbers of auxiliary vessels such as ferries and lighters. The lack of available shipping was countered by the contraction of the war in the Mediterranean. With North Africa, Sicily, and parts of Southern Italy under Allied control; shipping was required only for the Adriatic, the Aegean and along the southern coast of France.

Having played an important role in the interdiction of shipping between Italy and North Africa, FAA involvement quickly ceased with the shift of the campaign into the Adriatic and Aegean. Their single engine aircraft simply lacked the range and endurance to reach the more distant shipping routes, and they were allocated to other duties, such as anti-submarines operations in the home theatre. The dedicated anti-shipping task forces that had operated previously out of Malta and North Africa were also disbanded. The Adriatic and particularly the Aegean were still very much enemy territory, and the Axis retained aerial superiority over much of it.

The greater distances to these areas meant that conducting anti-shipping operations entirely at night before withdrawing to negate air attacks was particularly difficult and dangerous, as demonstrated by heavy losses when this was attempted in the Dodecanese campaign.⁶² As such, the campaign was pursued primarily by aircraft and submarines, while Royal Navy coastal forces worked to interdict coastal shipping.

Since December 1943, the newly created Mediterranean Allied Air Forces (MAAF) had formed the first theatre-wide air force, comprising all the Allied air assets available. Like its smaller predecessor based in northwest Africa, the NAAF, it was built on a tri-force structure of strategic, tactical and coastal air forces. The creation of the Mediterranean Allied Coastal Air Forces (MACAF) meant that the anti-shipping campaign could finally draw on a centralised, theatre-wide dedicated maritime air force. While the campaign had certainly lessened in intensity, there was still a significant number of shipping strikes being conducted. Table 1 shows the number of shipping strikes conducted in 1944 by month, and their proportion of the total air activity.

Month	Total No. Sorties	No. Shipping Strikes	Total Flying Hours	Shipping Strike Flying Hours
Jan	3883	28 (0.72%)	13965	136.5 (0.98%)
Feb	3142	88 (2.80%)	10801.75	459.75 (4.26%)
Mar	3695	63 (1.71%)	12704.5	247.75 (1.95%)
Apr	4914	41 (0.83%)	17645	175.75 (0.97%)
May	5786	44 (0.76%)	19645.25	173.5 (0.88%)
Jun	6155	176 (2.86%)	20851.75	647.25 (3.10%)
Jul	6664	110 (1.65%)	21018.75	513.25 (2.44%)
Aug	7098	120 (1.70%)	23151.25	512 (2.21%)
Sept	7173	234 (3.26%)	21399.5	988.75 (4.62%)
Oct	3546	133 (3.75%)	10470.25	532 (5.08%)
Nov	3951	72 (1.82%)	11327	323.75 (2.86%)
Dec	5484	39 (0.71%)	13392	181.75 (1.36%)

Table 1: MAAF Anti-Shipping Operations in 1944⁶³

Clearly, there were still significant number of strikes conducted, but they formed a very small proportion of the total air effort of the MAAF as a whole. As late as September 1944, 234 shipping strikes were flown, totalling nearly 1,000 flying hours, but this was still less than 5% of the total air effort that month. There was however, an increase in the bombing of the Axis held ports in Italy and Southern France in 1944, spearheaded by the USAAF. This reached a peak on 11 March in a huge raid on Toulon by 122 Liberator aircraft, which sank eight vessels along with heavy damage to the port facilities.⁶⁴

Rocket projectile (RP) weapons were first introduced into the theatre on a very limited scale in May 1943 for anti-submarine purposes. It was not until much later in the year that they began to appear in much greater numbers and be used for anti-shipping operations.⁶⁵ However, tactical doctrine was soon set down for the use of 25lb solid-shot RPs in the anti-shipping campaign there, adapted slightly from the doctrine already in place for the Home theatre. Much like the torpedo strikes, RP attacks in the daytime required an 'anti-flak' screen of aircraft armed with cannon and bombs to suppress the escorting vessels before the strike aircraft made their attack runs. The ratio of 'anti-flak' aircraft to strike aircraft to be used was dependent on the likely ratio of escorts to merchant vessels, with ideally at least two of these aircraft for each escort.⁶⁶ Both the RP strike aircraft and the 'anti-flak' aircraft escorting them were generally different variants of the Beaufighter aircraft. The 25lb solid-shot rocket was an ideal weapon to deal with the smaller sized craft that were the main target at that stage of the campaign. They were both more likely to hit a small-draught vessel than a torpedo, which would often pass underneath, and were more economically efficient.

After the Italian armistice, the contraction of the campaign to smaller sub-theatres and the shrinkage of shipping available to the Axis, it is rather surprising that sinking rates were quite heavy for most of 1944. There were 22 sinkings in January, whereas the previous four months combined had yielded only 32. From January to September monthly sinking totals ranged between 13 and 40, only dropping to very low levels for the last three months of the campaign. Perhaps less surprising is the fact that the vessels being sunk were generally smaller than the previous years. The average size of a merchant vessel sunk by aircraft in 1944 was 1,429 GRT, well below the 2,217 of 1942 or the peak of 2,909 in 1940. However, the average size was actually slightly larger than in 1943, when it was 1,395 GRT. In total, allied air power accounted for 225 vessels of 321,589 GRT in 1944.⁶⁷

Conclusions

The role of air power in the early stages of the anti-shipping campaign in the Mediterranean was a familiar story for the British. Paucity of resources and a general lack of both the technical and tactical ability to conduct effective maritime operations meant the RAF played little part at first. It is fortunate that RAF Middle East was commanded by someone who immediately recognised the importance of the Mediterranean Sea to war in North Africa and the Middle East, and that air power would need to play a major role in the war at sea as well as on land. Longmore was able to lay the foundation for air power to do so, but in the early stages of the campaign the RAF could only contribute with a handful of reconnaissance aircraft. It was left to a small number of FAA aircraft to conduct actual anti-shipping operations alongside the efforts of Royal Navy submarines.

With their much greater training and experience in maritime operations, the FAA contributed consistently to the campaign between 1940 and 1943. Small numbers of outdated biplane torpedo bombers took a steady toll of Axis shipping from their primary base in Malta, along with more sporadic efforts from North Africa, Crete and Cyprus when the situation and

availability of air bases made it possible. For the RAF, integration into an active role in the campaign was slow with numerous obstacles. The lack of available aircraft was compounded by both the unsuitability of the types that were available to anti-shipping operations and the inexperience of the crews to such work. Even after an influx of more suitable aircraft, better training for RAF aircrew in maritime operations and a higher priority toward the campaign, the FAA still proved much more adept. Despite their outmoded aircraft, in late 1942 Swordfish and Albacore aircraft in the Eastern basin maintained a 42 per cent hit rate with their torpedo drops, compared to just 23 per cent for Beaufort aircraft and 28 per cent for torpedo-armed Wellingtons.⁶⁸

While the RAF never managed to become more efficient in their shipping strikes than the FAA, the heavier burden fell on them in the second half of the campaign. They outnumbered the limited FAA in available strike aircraft from February 1942 onwards, and overwhelmingly so by the end of that year. The transformation in the ability of the RAF to conduct anti-shipping operations over the course of the campaign was a marked one. In 1940 they lacked every crucial foundation for a successful campaign – numbers, suitability of aircraft, specialist training, tactical doctrine and a high priority towards the campaign. Each of these issues began to be addressed in 1941. From June onwards, greater numbers of aircraft arrived in the theatre, that were used for strike purposes. This included more specialised types of aircraft dedicated to maritime operations. Some of the aircraft that were arriving in the theatre were specialised anti-shipping squadrons transferred directly from RAF Coastal Command, at the expense of their campaign in northwest Europe. This strongly suggests that the priority of the campaign in the Mediterranean was increasing in the eyes of the Air Ministry.⁶⁹ The creation of No. 201 (Naval Co-operation) Group in October helped combat the issue of specialised training, and by proxy that of specialised tactical doctrine as well. The Group brought FAA and RAF personnel under the same command for the first time in the theatre, allowing specialised maritime training to be offered from the naval aircrews to those of the other service. In turn, improvements in RAF doctrine for torpedo attacks were made, adapting those used by Coastal Command to the specific conditions and situation in the Mediterranean. Costly mast-height direct bombing attacks were also later dropped, with the focus laid on the more effective torpedo attacks and bombing of ports. By late 1943, rocket projectiles were available, which were a much more effective weapon against the smaller vessels with a lesser draught which were then being faced. A comprehensive tactical doctrine for rocket attacks in the Mediterranean quickly followed.

By 1944 the transformation in the role of air power in the anti-shipping campaign was complete. The numbers technologies and tactics had been brought into place for a successful campaign. It had played a crucial part in the campaign. Out of the total 1,702 vessels of 2,777,573 GRT that were sunk, 741 of 1,210,368 GRT were the result of aircraft. Air power had sunk 44 per cent of the total number of vessels, and 44 per cent of the total tonnage. By comparison, submarines were responsible for slightly more sinkings (773) but a slightly smaller tonnage (1,194,240).⁷⁰ Not only was air power vital in its contribution by direct sinkings,

it was also a big contributor to the mining campaign that took place, laying 1,504 mines.⁷¹ Finally air power was crucial to the success of all methods of attacking shipping. Aerial reconnaissance gave vital information on the state of shipping in Axis ports and located at sea. Anti-shipping task forces, submarines and aerial shipping strikes were guided onto their targets by circling aircraft, and often protected by aerial escorts. It is no coincidence that the periods of greatest success in the campaign coincided with the periods of aerial ascendancy in the theatre.

Air power was a vital component without which the heavy toll on Axis shipping in the Mediterranean would not have been taken. The question of the ability of Axis forces to have continued the war in North Africa as long as they did, or even the ability of Italy to sustain its war effort as a whole, had greater resources been allocated to the anti-shipping campaign, makes for yet another tantalising 'what if' of the war.

Notes

¹ Charles W. Koburger, *Wine-Dark, Blood Red Sea: Naval Warfare in the Aegean 1941-1946* (Westport, Praeger, 1999), 7.

² This view is reinforced by numerous general histories of the war in the Mediterranean and the war in North Africa which do not go beyond either the Axis surrender in North Africa or the Italian Armistice. See for example Donald Macintyre, *The Battle for the Mediterranean* (London, Batsford, 1964); Martin van Creveld, *Supplying War: Logistics from Wallenstein to Patton* (Cambridge, Cambridge University Press, 1977); Jack Greene and Alessandro Massignani, *The Naval War in the Mediterranean, 1940-1943* (London, Chatham, 1998); Alan J. Levine, *The War Against Rommel's Supply Lines 1942-1943* (Westport, Praeger, 1999). Notable exceptions to this rule can be found in the multi-service British official history of the theatre, I.S.O Playfair et al, *The Mediterranean and the Middle East* (London, HMSO, 1954-1988), VI volumes, and the more recent naval history Vincent O'Hara, *Struggle for the Middle Sea: The Great Navies at War in the Mediterranean Theatre, 1940-1944* (Annapolis, Naval Institute Press, 2009).

³ The National Archives [TNA] ADM 187/8, Admiralty Pink List entry for 10 June 1940.

⁴ Royal Air Force Museum [RAFM], The papers of Air Chief Marshal Sir Arthur Longmore [Longmore papers], DC 74/102/14, Despatch on Middle East Air Operations, 1. Appendix 'B': Location of Units in Middle East Command as at 11 June 1940.

⁵ RAFM, Longmore papers, DC 74/102/14, Despatch on Middle East Air Operations, Appendix 'B': Location of Units in Middle East Command as at 11 June 1940.

⁶ RAFM, Longmore papers, DC 74/102/14, Despatch on Middle East Air Operations, Appendix 'A': Air Council Instructions as to Responsibilities of Air Officer Commanding in Chief, Middle East, 11 June 1940, 1.

⁷ TNA AIR 41/19, 'The RAF and Maritime War, Volume VI: The Mediterranean and Red Sea' [RAF and Maritime War, Vol. 6], 42-3.

⁸ Michael Simpson (Ed.), *The Cunningham Papers, Volume I: The Mediterranean Fleet, 1940-1942* (Aldershot, Ashgate, 1999), 97-8, 113, 128-131, 137, 170-2.

⁹ For an excellent introduction to the question of enemy merchant vessels in wartime throughout British history, see Andrew Lambert, 'Great Britain and Maritime Law, from the Declaration of Paris to the era of Total War', *Navies in Northern Waters*, ed. Rolf Hobson and Tom Kristiansen (London, Frank Cass, 2004), 11-39 and Brian Ranft, 'Restraints on Warfare at Sea before 1945', in Michael Howard ed., *Restraints on War*, (Oxford, Oxford University Press, 1979, 39-56.

¹⁰ TNA AIR 41/19, RAF and Maritime War, Vol. VI, Appendix B: Air Ministry Instructions on Air Action against Shipping at Sea.

¹¹ S.W. Roskill, *The War at Sea, Volume I: The Defensive* (London: HMSO, 1954), 338; Duncan Redford, *The Submarine: A Cultural History from the Great War to Nuclear Combat* (London, I.B. Tauris, 2010), 147-8. A 'naval auxiliary' was defined as a vessel carrying troops or military stores.

¹² TNA ADM 234/381, Naval Staff History [NSH], Submarines, Volume II: Operations in the Mediterranean [Submarines, Vol. II], 3.

¹³ TNA CAB 66/9/37, WP(40) 257, 'Proposed Declaration of Dangerous Areas off the Coasts of Italy and Colonies', 10 July 1940; TNA ADM 234/381, NSH, Submarines, Vol. II, 4.

¹⁴ TNA CAB 66/16/12, WP(41) 89, Extension of 'Sink at Sight' Zone in the Mediterranean, 20 April 1941; TNA ADM 234/381, NSH, Submarines, II, 20.

¹⁵ F.H. Hinsley et al, *British Intelligence in the Second World War*, Volume I (London, HMSO, 1979), 199, 206.

¹⁶ *Ibid*, 210.

¹⁷ On tactical developments of the FAA in the interwar and war years, see Philip Weir, *The Development of Naval Air Warfare by the Royal Navy and Fleet Air Arm between the two World Wars* (PhD Thesis, University of Exeter, 2007) and Geoffrey Till, *Airpower and the Royal Navy* (London, Jane's, 1979).

¹⁸ Kenneth Poolman, *Night Strike from Malta: 830 Squadron RN and Rommel's Convoys* (London, Jane's, 1980), 22.

¹⁹ Simpson ed., *The Cunningham Papers*, Vol. I, 100; TNA AIR 20/9598, Table 2: 'Analysis of Enemy Merchant Shipping Sunk by all Causes, Scuttled, Captured or Surrendered in the Mediterranean'.

²⁰ TNA AIR 20/9598, Table 2: 'Analysis of Enemy Merchant Shipping Sunk by all Causes, Scuttled, Captured or Surrendered in the Mediterranean'.

²¹ *Ibid*. The port of Valona in particular was singled out in this month, receiving several raids, David Gunby and Pelham Temple, *Royal Air Force Bomber Losses in the Middle East and Mediterranean, Volume I: 1939-1942* (Hinckley, Midland, 2006), 33-36.

²² Calculated from Gunby and Temple *Royal Air Force Bomber Losses*, 17-48; Poolman, *Night Strike*.

²³ Quoted in Douglas Austin, *Malta and British Strategic Policy, 1925-1943* (London, Frank Cass, 2004), 111.

²⁴ TNA ADM 187/12, Admiralty Pink List entry for 3 March 1941.

²⁵ Christina Goulter, *A Forgotten Offensive: Royal Air Force Coastal Command's Anti-Shipping Campaign, 1940-1945* (Abingdon, Frank Cass, 1995), 132, 139, 143.

²⁶ TNA ADM 187/14, Admiralty Pink List entry for 2 July 1941.

²⁷ Sources examined here for the FAA are TNA ADM 207/13, 815 Squadron Diary, 1939-1941; TNA ADM 207/14, 819 Squadron Diary, 1940-1941; TNA ADM 207/22, 826 Squadron Diary, 1940-

1946; TNA AIR 23/672, Operations by FAA Units; TNA ADM 199/108 Night Operations of 830 Squadron from Malta; TNA ADM 199/109, Night Operations by Naval Air Squadrons based on Malta.

Sources examined here for the RAF are TNA AIR 27/1508, 252 Squadron Operational Record Book [ORB]; TNA AIR 27/1577, 272 Squadron ORB, 1940-1943; TNA AIR 27/407, 39 Squadron ORB.

²⁸ TNA ADM 234/560, NSH, British Mining Operations, 1939-1945, Volume I, 1973, 579-580.

²⁹ Hugh Lloyd, *Briefed to Attack: Malta's Part in African Victory* (Norwich, Hodder and Stoughton, 1949), 13.

³⁰ *Ibid*, 27-28, 62, 149.

³¹ Details of the information on convoy sailings provided by this intelligence are located in TNA ADM 223/31, 'Italian Convoy Reports, October 1941 – May 1943' and TNA ADM 223/45, 'Analysis of Convoy Sailings from Italy to North Africa, September 1941 – June 1943'.

³² Figures based on Admiralty Pink List entries from May 1941 – February 1942, TNA ADM 187/13-17.

³³ RAFM, Longmore papers, DC 74/102/14, Despatch on Middle East Air Operations, 3.

³⁴ Arthur Tedder, *With Prejudice: The War Memoirs of Marshal of the Air Force Lord Tedder* (London, Cassell, 1966), 148.

³⁵ Michael Simpson, 'Wings Over the Sea: The Interaction of Air and Sea Power in the Mediterranean, 1940-42' in N.A.M Rodger ed., *Naval Power in the Twentieth Century* (Basingstoke, Macmillan, 1996), 144-5.

³⁶ TNA AIR 23/1282, 'Air Tactics and Operational Notes on 201 Naval HQ', 1. For an in-depth discussion of the creation of 201 Group, see Richard Hammond, 'British Aero-Naval Co-operation and Rivalry and the Creation of RAF No 201 (Naval Co-operation) Group' in Ross Mahoney, Stuart Mitchell and Michael LoCicero (eds), *A Military Transformed? Innovation and Adaptation in the British Military from 1792 to 1945*, (forthcoming, Helion and Company, 2013).

³⁷ TNA AIR 23/1282, Air Tactics and Operational Notes on 201 Naval HQ and RAF Middle East Co-op Group by Tactics Assessment Officer, Coastal Command Tactical Memorandum No.59.

³⁸ TNA AIR 23/1282, Air Tactics and Operational Notes on 201 Naval HQ and RAF Middle East Co-op Group by Tactics Assessment Officer, Chapter 3: 'Navigation'; TNA AIR 23/1282, Air Tactics and Operational Notes on 201 Naval HQ and RAF Middle East Co-op Group by Tactics Assessment Officer, Annex F: 'Method of searching for coastal convoys'.

³⁹ TNA AIR 23/1282, Air Tactics and Operational Notes on 201 Naval HQ and RAF Middle East Co-op Group by Tactics Assessment Officer, 'A summary of naval co-operation', 2; TNA AIR 20/5306, Operational Research Section (Middle East) report number 4, 'An Account of Anti-Shipping Operations Carried out by Aircraft Operating from Malta between Oct 1 and Dec 12 1941', 4-5.

⁴⁰ TNA AIR 20/9598, Table 2: 'Analysis of Enemy Merchant Shipping Sunk by all Causes, Scuttled, Captured or Surrendered in the Mediterranean'.

⁴¹ Tony Spooner, *Supreme Gallantry: Malta's Role in the Allied Victory* (London, J.Murray, 1996), 105.

⁴² These losses have been calculated from the following sources: Gunby and Peham Temple, *Royal Air Force Bomber Losses*; Roy Conyers Nesbit, *The Armed Rovers, Beauforts and Beaufighters*

over the Mediterranean (Shrewsbury, Airlife, 1995); Poolman, *Night Strike from Malta*.

⁴³ Michael J. Budden, 'Defending the Indefensible? The Air Defence of Malta, 1936-1940', *War in History*, Vol. 6, No. 4 (October, 1996) 463.

⁴⁴ This has been calculated through the following sources: TNA ADM 199/108 Night Operations of 830 Squadron from Malta; TNA ADM 199/109, Night Operations by Naval Air Squadrons based on Malta; TNA AIR 27/1508, 252 Squadron ORB; TNA AIR 27/1577, 272 Squadron ORB, 1940-1943; TNA AIR 27/407, 39 Squadron ORB.

⁴⁵ The figures in the Admiralty Pink List entries from January – June 1942, TNA ADM 187/17-19 demonstrate small total increases in each of these months, along with the location of the squadrons.

⁴⁶ CAB 105/10, Telegram No.84, Chiefs of Staff to Middle East CinCs, 30 July 1942.

⁴⁷ TNA AIR 15/628, 'Suggestions for homing day striking forces to their target', 5 May 1942, 1.

⁴⁸ TNA AIR 15/633, 'Memorandum on the Use of Beaufighters in Combined Attack with Torbeaus and Strafing Beaufighters', 2 February 1943.

⁴⁹ TNA AIR 23/1282, Coastal Command Tactical Memorandum No. 59, 1.

⁵⁰ Budden, 'Defending the Indefensible', 447.

⁵¹ Austin, *Malta*, 159-161; Greene and Massignani, *The Naval War in the Mediterranean*, 260.

⁵² Richard Woodman, *Malta Convoys, 1940-1943* (London, John Murray, 2000), 459-461.

⁵³ Imperial War Museum [IWM], 87/39/1, Papers of EPW Hutton, Appendix A: 'Enemy Convoy Tactics in the Mediterranean', 1.

⁵⁴ These figures have been determined from TNA ADM 223/45, 'Special Intelligence Summaries: Analysis of Convoy Sailing from Italy to North Africa', September 1941 – June 1943.

⁵⁵ TNA ADM 223/48, 'Sicily - Tunis Convoys', 3 March 1943.

⁵⁶ See John Campbell, *Naval Weapons of World War Two* (London, Conway Maritime Press, 2002), 338-347.

⁵⁷ Greene and Massignani, *The Naval War in the Mediterranean*, 262.

⁵⁸ These figures have been calculated primarily from those given in TNA AIR 20/9598, Table 2: 'Analysis of Enemy Merchant Shipping Sunk by all Causes, Scuttled, Captured or Surrendered in the Mediterranean'.

⁵⁹ Ibid.

⁶⁰ On air operations over the Aegean during the campaign, see Nesbit, *The Armed Rovers*, 164-185. On the Dodecanese campaign more generally see P. Smith and E. Walker, *War in the Aegean* (London, William Kimber, 1974); Ian Gooderson, 'Shoestring Strategy: The British Campaign in the Aegean, 1943', *Journal of Strategic Studies*, Vol. 25, No. 3 (September 2002), 1-36; Anthony Rogers, *Churchill's Folly: Leros and the Aegean: the last great British defeat of the Second World War* (London, Cassell, 2003).

⁶¹ TNA ADM 223/488, Draft paper by Charles Morgan, 2.

⁶² See Paul Kemp, *The Admiralty Regrets: British Warship Losses of the 20th Century* (Stroud: Sutton, 1999).

⁶³ Figures taken from TNA AIR 20/2034, 'Mediterranean Allied Air Force: miscellaneous statistics'.

⁶⁴ TNA AIR 41/76, 'The RAF and Maritime War, Volume VII: Mediterranean; Naval Co-operation, end of the Submarine War and Operations in the Adriatic, Greece and the Aegean, 1944-1945',

Part II, 217.

⁶⁵ Nesbit, *The Armed Rovers*, 186-7.

⁶⁶ TNA AIR 23/7191, Anti-Shipping Operations: Policy, 1944. Appendix A, 'Shipping Attacks With 25lb R.Ps', 1.

⁶⁷ All figures in this paragraph have been calculated from those in TNA AIR 20/9598, Table 2: 'Analysis of Enemy Merchant Shipping Sunk by all Causes, Scuttled, Captured or Surrendered in the Mediterranean.'

⁶⁸ TNA AIR 20/5306, 'Anti-Shipping in the Eastern Mediterranean, October-December 1942', 1.

⁶⁹ Austin, *Malta*, 98, 112, 127; Goulter, *Forgotten Offensive*, 132, 139, 143, 168.

⁷⁰ The figures for aircraft are from TNA AIR 20/9598, Table 2: 'Analysis of Enemy Merchant Shipping Sunk by all Causes, Scuttled, Captured or Surrendered in the Mediterranean', those for submarines are from Jürgen Rohwer, *Allied Submarine Attacks of World War Two: European Theatre of Operations, 1939-1945* (London, Greenhill books, 1997), 125-223.

⁷¹ TNA ADM 234/560, NSH, British Mining Operations, 1939-1945, Volume I, 650.