



THE AUSTRALIAN PIGEON CENTRE

"Where Passion takes Flight"

Thermal Wind Currents and Thoughts on Pigeons Racing over Open Water.

By Barry Trewin

Over the years people have questioned the ability of Pigeons to cover long distances over open water. Here is some information to prompt some thought on the matter and have the Fancier review his birds more carefully when they are flying over open water.

Are there Thermal wind currents over water?

Thermal wind currents, also known as thermals, are vertical air movements caused by temperature differences in the atmosphere. While thermals are commonly observed over land, they are not typically found over large bodies of water.

There are a few key reasons why thermal wind currents do not occur over water:

1. **Lack of Surface Heating:** Thermals are primarily generated by the differential heating of the Earth's surface. Over land, the Sun's radiation heats the surface, causing air near the ground to warm and rise, creating thermal updrafts. However, water has a higher specific heat capacity compared to land, meaning it takes longer to heat up. As a result, the temperature gradients necessary to initiate thermals are generally absent over water bodies.
2. **Homogeneous Surface:** Unlike land, which consists of various surfaces such as forests, deserts, and mountains, the surface of water is relatively uniform. This uniformity leads to less temperature variation across the water surface. Without significant temperature contrasts, there is less likelihood of thermal differentials required for the formation of thermals.
3. **Stable Atmospheric Conditions:** Over water, the presence of a nearby large body of water tends to stabilise the lower atmosphere. Water has a moderating effect on temperature, meaning it can prevent rapid heating or cooling of the air above it. This stability suppresses the formation of strong vertical convective currents like thermals.
4. **Influence of Water Evaporation:** Water bodies have a higher tendency to evaporate compared to land surfaces. Evaporation results in the release of latent heat, which can further stabilise the lower atmosphere. This additional stabilisation diminishes the chances of thermal wind currents over water.

While thermals are not common over water, it is important to note that other atmospheric phenomena, such as sea breezes, can occur in coastal areas. Sea breezes are driven by differential heating between land and water, creating horizontal wind currents rather than vertical convective motions.

How Thermal wind currents assist birds flying over land

Thermal wind currents play a significant role in assisting birds during flight over land. These upward-moving air masses, also known as thermals, offer several advantages to birds:

1. **Lift and Soaring:** Thermals provide birds with a source of lift, allowing them to gain altitude without exerting much energy. As the sun heats the Earth's surface, it warms the air near the ground, creating thermal updrafts. Birds can take advantage of these rising currents by soaring within them, effectively gliding and conserving energy. By circling within thermals, birds can maintain or even gain altitude without flapping their wings extensively.
2. **Extended Flight Range:** By utilising thermal wind currents, birds can extend their flight range and cover long distances more efficiently. Thermals often form in specific areas where the terrain and local weather conditions are favourable, such as near mountains or over open fields. Birds can strategically locate and utilise these thermals to maintain their flight and navigate over vast distances, conserving energy and maximising their endurance.
3. **Observation and Predation:** Birds of prey, such as hawks and eagles, benefit from thermals in their hunting strategies. These raptors have keen eyesight and can spot prey from great heights. By soaring within thermals, they can gain altitude and obtain a broader view of their surroundings, scanning the landscape for potential prey. The upward motion of thermals enables predatory birds to stay airborne for extended periods, increasing their chances of spotting and capturing prey.
4. **Migration:** Many bird species undertake long-distance migrations, covering thousands of miles. Thermals are instrumental in facilitating these migratory journeys. As birds encounter thermals along their migration routes, they can utilise the updrafts to gain altitude and conserve energy. By effectively "riding" the thermals, birds can maintain their desired flight path, minimise fatigue, and successfully complete their migratory journeys.

It is worth noting that different bird species have varying abilities to exploit thermal wind currents. Some birds, such as raptors and large soaring birds, are particularly adept at utilising thermals due to their physical adaptations, including long wingspan and specialised flight behaviours. However, even smaller birds can make use of thermals to some extent, taking advantage of localised thermal sources to enhance their flight performance.

How birds with long end flights are able to use the thermal wind currents better than birds with all their end flights close together

Birds with long, spread-out wingtips are able to utilise thermal wind currents more effectively compared to birds with wings that have all their end flights close together.

1. **Increased Wing Surface Area:** Birds with long, spread-out wingtips, such as raptors and albatrosses, have a larger wing surface area. This extended wing area allows them to capture more air as they soar within thermal updrafts. The larger wing surface provides increased lift, enabling these birds to stay airborne for longer durations and take full advantage of the rising air currents.
2. **Improved Gliding Efficiency:** The elongated wing shape of birds with long end flights allows for better gliding efficiency. The wings act as air foils, generating lift as air flows over and beneath them. With the longer wingtips, the bird can achieve a higher aspect ratio, which refers to the ratio of wing length to wing width. A higher aspect ratio enhances the bird's gliding ability by reducing drag and increasing lift, making it easier for them to maintain altitude within thermals.

3. **Enhanced Manoeuvrability:** Birds with long end flights have greater control over their flight manoeuvres within thermals. The elongated wingtips provide increased surface area for precise adjustments in response to changing air currents. This adaptability allows birds to position themselves optimally within the thermal updrafts, maximising their lift and soaring capabilities. The improved manoeuvrability enables them to efficiently navigate and exploit thermal wind currents.
4. **Long-Distance Soaring:** Birds with long end flights are often associated with long-distance soaring. These species, such as migratory birds or large soaring birds like vultures, have evolved to take advantage of thermal wind currents during their extensive flights. The combination of longer wings and spread-out wingtips enables them to efficiently utilise the rising air within thermals, conserving energy and covering significant distances without the need for constant flapping.
5. **Adaptation to Specific Environments:** Birds with long end flights have often adapted to specific environments where thermal wind currents are prevalent. For example, raptors are commonly found in open habitats, such as grasslands or mountainous regions, where thermals form regularly. Their elongated wings and specialised flight behaviours allow them to capitalise on these thermal updrafts, aiding their hunting strategies and survival.

Overall, the elongated wing shape and spread-out end flights of certain bird species provide them with distinct advantages when it comes to utilising thermal wind currents. These adaptations enhance their soaring abilities, manoeuvrability, and long distance flight capabilities, allowing them to thrive in environments where thermals are common.

Pigeons with their end flights close together are more suited to fly over vast kilometres of water as they don't need to work as hard given the fact that there are no thermal wind currents over water to assist them

Pigeons, with their end flights close together, are more suited to fly over vast kilometres of water due to their wing design, which allows them to sustain flight without relying on thermal wind currents for assistance. Here's how their wing configuration benefits them in the absence of thermals over water:

1. **Efficient Flapping Flight:** Pigeons have relatively short and compact wings, with their primary feathers close together towards the wingtip. This wing structure is well-suited for flapping flight, where the bird generates lift by continuously flapping its wings. In the absence of thermal wind currents over water, pigeons rely on their powerful wing muscles and flapping motion to maintain flight. The close proximity of their end flights allows for efficient airflow and effective wing movement during flapping flight.
2. **Wing Loading:** Wing loading refers to the ratio of a bird's body weight to its wing area. Pigeons typically have moderate wing loading, meaning their wings support a relatively proportional amount of their body weight. This characteristic enables them to maintain stable flight even in the absence of thermals. The close arrangement of their end flights contributes to their wing loading, providing the necessary lift to sustain flight over long distances without relying on rising air currents.

3. **Endurance and Stamina:** Pigeons are renowned for their exceptional endurance and stamina during long-distance flights, including journeys across vast bodies of water. Their wing design, with end flights close together, allows them to maintain a steady, energy-efficient flapping flight. Pigeons can sustain their flight by adjusting their wing beats and optimising their wing shape to minimise drag and maximise lift. This endurance and stamina are crucial for their successful navigation over extended water crossings.
4. **Navigation Abilities:** Pigeons possess remarkable navigation abilities, relying on a combination of visual cues, magnetic fields, and celestial navigation to orient themselves during long flights. This innate sense of direction helps them choose optimal flight paths over water and reach their intended destinations without relying on thermal wind currents for guidance.
5. **Adaptability:** Pigeons are highly adaptable birds, capable of adjusting their flight behaviour to the prevailing conditions. When flying over water, where thermal wind currents are absent, they rely on their agile flight capabilities, efficient wing design, and navigation skills to ensure successful journeys. Their ability to adapt to different environments enables them to traverse vast distances even in the absence of thermals.

Pigeons with their end flights close together are well-suited for flying over vast distances of water. Their wing design allows for efficient flapping flight, moderate wing loading, endurance, and adaptability. These attributes, combined with their exceptional navigation abilities, enable pigeons to complete successful long-distance flights without relying on thermal wind currents over water.

Racing Pigeons from the State of Tasmania in Australia are remarkable given the fact once they race from the mainland in Australia they have to cover 322 kilometres (200 miles) of open water to reach Tasmania.

Racing pigeons from the state of Tasmania in Australia demonstrate remarkable abilities, particularly when they participate in races that require them to cover approximately 322 kilometres (200 miles) of open water to reach Tasmania from the mainland. Here are some key aspects that make these pigeons exceptional:

1. **Navigation Skills:** Racing pigeons possess extraordinary navigation capabilities. They have an innate sense of orientation and can navigate using a variety of cues, such as visual landmarks, celestial cues, magnetic fields, and olfactory signals. These abilities enable them to chart a course across the open water, utilising their instincts to stay on track and reach their destination in Tasmania.
2. **Homing Instinct:** Pigeons have a strong homing instinct, which means they have an innate ability to return to their home loft. This instinct is honed through training and breeding practices. When racing pigeons are released on the mainland, they rely on their homing instinct to guide them back to their loft in Tasmania. Despite the challenging 322 kilometre (200 mile) stretch of open water, their powerful homing ability allows them to navigate the vast expanse and find their way home.
3. **Physical Adaptations:** Racing pigeons often possess physical attributes that contribute to their ability to traverse long distances over water. Their streamlined body shape and efficient wing design, with end flights close together, minimise drag and enhance their flying performance. These adaptations enable them to maintain sustained flight, conserve energy, and cover significant distances, including the challenging water crossing to Tasmania.

4. **Endurance and Stamina:** Racing pigeons are renowned for their endurance and stamina. These birds undergo extensive training regimes that gradually build their physical fitness and endurance levels. As a result, they can withstand the demands of long flights, including the arduous journey across the open water to Tasmania. Their well-developed cardiovascular system, efficient respiratory capabilities, and muscular strength allow them to endure the challenges of the long-distance race.
5. **Selective Breeding:** Pigeon racing enthusiasts employ selective breeding techniques to enhance the racing abilities of the birds. Over generations, pigeons with superior homing instincts, navigation skills, and endurance are chosen as breeding stock. This selective breeding process helps perpetuate and refine the exceptional traits necessary for successful racing, including the ability to cover significant distances over water.

Racing Pigeons from Tasmania in Australia showcase exceptional skills and capabilities when they participate in races that require them to cross 322 kilometres (200 miles) of open water, much of which is the final leg of their journey home. Their innate navigation abilities, homing instincts, physical adaptations, endurance, and the practice of selective breeding contribute to their remarkable performance in these challenging races. These pigeons exemplify the resilience, adaptability, and determination of these remarkable avian athletes.

Racing Pigeons in Taiwan also compete in many races over open water.

Racing pigeons in Taiwan also participate in numerous races that involve flying over open water. Taiwan has probably the largest amount of pigeon fanciers in the World. Here is a brief outline highlighting their involvement and challenges:

1. **Participation in Open Water Races:** Racing pigeon enthusiasts in Taiwan organise races that require pigeons to fly over open water. These races often involve crossing the Taiwan Strait or other bodies of water surrounding the island. The pigeons are released from the mainland and must navigate their way back to their home lofts in Taiwan, covering considerable distances over water.
2. **Navigational Skills and Homing Instinct:** Similar to racing pigeons in other regions, Taiwan's racing pigeons possess remarkable navigational skills and a strong homing instinct. These birds rely on a combination of visual cues, celestial navigation, magnetic fields, and their innate sense of orientation to find their way back home. Their ability to navigate over open water showcases their exceptional skills in charting a course and returning to their lofts in Taiwan.
3. **Physical Adaptations:** Racing pigeons in Taiwan, like their counterparts elsewhere, possess physical adaptations that aid their performance during open water races. Their streamlined body shape, efficient wing design, and strong flight muscles enable them to maintain sustained flight and endure the challenges of flying over long distances of open water. These physical attributes contribute to their ability to cover the demanding race courses.
4. **Training and Conditioning:** Racing pigeon enthusiasts in Taiwan invest significant time and effort into training and conditioning their birds. Pigeons undergo rigorous training regimes that gradually increase their endurance and strengthen their flight muscles. They are exposed to various flight conditions, including simulated open water crossings, to prepare them for the challenges they may encounter during races over water.
5. **Competition and Prestige:** Open water races in Taiwan's pigeon racing community are highly competitive and prestigious events. Pigeon fanciers and enthusiasts eagerly participate in these races to showcase the abilities of their birds. The races serve as a platform for friendly

competition, where breeders and trainers strive to produce pigeons that can excel in the demanding open water courses.

6. **Appreciation for Pigeon Racing:** Pigeon racing holds a deep rooted cultural significance in Taiwan. It is not only a competitive sport but also a cherished tradition and hobby for many. The enthusiasm and passion for racing pigeons contribute to the growth and popularity of these open water races, fostering a vibrant community of pigeon racing enthusiasts in Taiwan.

Racing pigeons in Taiwan actively participate in many races over open water, such as the Taiwan Strait. Their navigational skills, homing instinct, physical adaptations, training, and the competitive spirit of Taiwanese pigeon racing enthusiasts make these races a significant aspect of the pigeon racing culture in Taiwan. It is a testament to the ability and quality of the racing pigeons in Taiwan.